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THE PENNSYLVANIA FORESTRY ASSOCIATION

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THE PENNSYLVANIA FORESTRY ASSOCIATION

Founded in June, 1886

Labors to disseminate information in regard to the necessity and methods of forest culture and preservation, and to secure the enactment and enforcement of proper forest protective laws, both State and National.

Annual Membership Fee, Three Dollars

One Dollar of which is for subscription to FOREST LEAVES

Neither the membership nor the work of this Association is intended to be limited to the State of Pennsylvania. Persons desiring to become members should send their names to the Chairman of the Membership Committee, 1007 Commercial Trust Building, Philadelphia.

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Forestry and the Pennsylvania Anthracite Coal Region

By CLEMENT MESAVAGE

THE anthracite coal region of Pennsylvania was once one of the most prosperous in the United States. More than 150,000 persons were directly employed by the coal industry itself in removing and preparing coal. Service industries and railroads were prosperous, many farms were fertile and productive, and some fine forests remained to be cut.

Times have changed. The 1928 production of 70 million tons of coal had, by 1932, dropped to 47 millions and in 1938 to 46 millions, involving a loss of direct mine employment of about 15 million man days of work. Employment in 1938 was only about one-half that of 1928. Dependent as they are upon the condition of the coal industry, service industries failed or hovered in the balance. By 1935 wages and salaries of all industries were only about half those earned in 1929; capital invested, however, had dropped only 1%. In the meantime, while demand for coal was being further reduced, improved mining technique was requiring fewer men, and thousands of boys and girls, formerly too young to seek employment, were now clamoring for jobs. In June of 1939 an estimated 175,000 employables were either unemployed, or supported by the Government, while many of those considered employed were struggling on a bare subsistence income.

What's wrong in the hard coal region and what

This article is a condensation of the February, 1939, report of the Anthracite Region Rehabilitation Committee to the Allegheny Section of the Society of American Foresters.

has forestry got to do with it? Perhaps it will be well to first review the more important resources of this area.

Location and Extent. Ninety-three per cent. of all anthracite mining has taken place in Luzerne, Schuylkill, Lackawanna, and Northumberland Counties. With the coal deposits in Carbon, Columbia, Dauphin, Lebanon, Susquehanna, and Wayne Counties, 484 square miles are underlain



PHOTO U. S. FOREST SERVICE

A Stream Flowing Freely Into a Mine Hole

with anthracite coal. While these counties comprise the total anthracite area, a forest economic unit would probably also include Monroe, Montour, Pike, Sullivan, Wyoming, and parts of Berks, Lehigh, and Northampton Counties.

Population. In 1930 total population approached two millions, one-third of which was rural.

Resources. Of major importance of course is hard coal; agriculture, surprisingly enough, is second, manufacturing, including diversified items such as metal products, textiles, quarry products, food products, leather and rubber goods, seems to be third; forests at present are about depleted; water power is negligible.

Present Condition of Resources Development. Present coal production and distribution facilities have a capacity for about 80 million tons; 1939 distribution probably did not exceed 53 millions, despite revived markets during the end of the year. This loss in coal markets is generally attributed to the fact that anthracite has not until recently been as convenient a fuel as oil, for instance; or it has been more expensive than, for example, soft coal. The condition is now being



PHOTO U. S. FOREST SERVICE

A breaker refuse bank. This scene was photographed by the author from a street within an anthracite community.

improved, largely through the efforts of Anthracite Industries, Inc., a research agency maintained by the coal operators.

Between 1930 and 1935 agricultural population increased 10%, while farms became 7% smaller and devalued 33 per cent. About 25% of the farms are devoted to grazed or ungrazed woodlots.

In 1926 (the latest year for which estimates by the Pennsylvania Department of Forests and Waters are available), about 65% of the taxable area was in forests. A quarter of this had trees of "merchantable" size (six inches in diameter, measured breast high); five-eighths had valuable forest tree species firmly established but of very small sizes, and the remainder was either barren or covered with worthless (from utilization standpoint) tree species. While total wood growth approached 42 million cubic feet per year, much of it occurred in small unmerchantable stands. Total wood consumption, half of which is used by the anthracite industry for mine timbers and lumber, was about 112 million cubic feet. Timber stands are generally understocked, culled, and often badly diseased. Forest fires have occurred frequently and have burned large areas. Based on averages covering 1934 to 1938, inclusive, 43% of all the forest fires and 30% of the area burned in Pennsylvania occurred in the anthracite region, principally in Luzerne, Carbon, Northumberland, Schuylkill and Lackawanna Counties.

Prosperity has waned in the anthracite region. The two most important effects have been unemployment and a denuded environment.

Denudation of the environment has also resulted from causes other than over-cutting and burning the forests over wide areas. Mine refuse banks associate with every anthracite community; more or less important areas have caved into the mines; deep cuts have been gouged out of the land surface through coal strippings operations, and streams are black and heavy with culm silt.

The Importance of Productive Forest Areas and an Attractive Environment. Productive forests in the anthracite region are imperative for a number of purposes, and it is significant that each in itself is so important that no attempt will be made to rate them in order. For one, timber to supply the mines, the railroads, the manufacturers, the construction industry, etc., is very much in demand and explains why the original, second growth and even third growth stands have been cut. Areas are easily accessible, and

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Our Wissahickon Valley

By MRS. FRANK MILES DAY

WHEN we ride along the Wissahickon Drive, past old Wissahickon Hall, around the curves and under the Reading Railroad Bridge to Ridge Avenue and the East River Drive, it is hard to realize that little over 100 years ago there was no roadway there. A path over the rocks alongside the Wissahickon Creek, tumbling over its falls past the old Robeson Mill and so into the Schuylkill, was the only entrance to the picturesque Valley.

The Indians of the Neighborhood

It must have been a well-traveled trail as the Indians followed it going from their village of Nittabacong (the Place Where the Warrior Lives), at Falls of Schuylkill to their council rock where the marble statue of Tedyuscong now stands looking out over the distant country to which his Lenni Lenape brethren were taken after the white man occupied their five villages. The names of those villages have for the most part persisted to remind us of the original inhabitants of Philadelphia. Shackamaxon, Peminaka or Pennypack, Arronimink and Passyunk in vari-

ous parts of the city, and in the neighborhood of our beautiful Valley Manayunk, the Indian name of the Schuylkill—Wingohocking, one of the Lenni Lenape chiefs and the Wissahickon itself the catfish stream of the Indians. This town of Nittabacong was visited by Peter Lindstrom, a famous Swedish geographer, in 1653, who described it as inhabited "by the most intelligent savages. They have their dwellings side by side and their land is cleared and cultivated."

The Indian chiefs of the neighborhood attended a Pow-wow with Governor Printz at Tinicum Island in 1654 and in 1677 the first grant of land, 300 acres, was made to John Matson and two others "at ye place called Wiessahitkonk on ye westsyde of ye Schuylkill." Later, William Penn visited these Indians, coming up the river in a canoe. He found the ground well cultivated by the Indians of the five villages producing corn, tobacco, squash, pumpkins, beans, etc., and a peach orchard at each village.

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JANUARY-FEBRUARY, 1940

ANNUAL MEETING

BREAKING a custom of many years standing, the Annual Meeting of The Pennsylvania Forestry Association will be held elsewhere than in Philadelphia. At the meeting of the Executive Board held on January 8, it was agreed to hold the meeting in Wilkes-Barre on February 27, 1940, at the Hotel Sterling. This move was made in order to start the campaign for forest fire prevention in the anthracite region during the spring fire season. This campaign will receive much of the attention of the Association during the coming three months.

Unless the number of fires can be reduced, any attempt at reforestation or management of the present forest lands will be of little value. With 1,900 fires in 1939 these seven hard-coal counties exceeded the total in the other sixty counties of the State. Because of this situation The Pennsylvania Forestry Association has set up a general forest fire prevention committee throughout the region. The members of that committee are: Mayor Charles N. Loveland, Wilkes-Barre; Wm. E. Mannear of the Tax-payers Association of Wyoming Valley; E. C. Deal, President, Scranton Spring Brook Water Company; J. Curtis Platt, Scranton; Francis H. Coffin, Scranton; Frank P. Benjamin, President of the Scranton Lackawanna Trust Company; Wm. H. Conyngham, Wilkes-

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The following persons from Hazleton are, also, members of this committee: Honorable James P. Costello, Mayor; Henry Walser, President, First National Bank; James P. Costello, Jr.; John E. Cotsack, City Solicitor; James D. Guckavan; Joseph D. Gallagher, Supt. of Schools; Robert Bersch; and Victor Diehm.

Every facility will be used to impress upon the people that every fire means a personal loss not only of the tax money used to extinguish it, but, also, through the destruction of timber and soil. In addition, repeated burning of timber lands by destroying humus has allowed great quantities of water to pour into the mines, thereby increasing the cost of mining, hence the cost of coal. This has naturally reduced the demand for coal and has stimulated the use of substitutes.

Protection will be the topic for talks and discussion at the Annual Meeting. Protection from fire will receive principal attention, but some time will, also, be devoted to other phases of this large problem. Because of the presence of Dutch elm disease in nearby Lehigh and Monroe Counties, many persons will want to know how they may protect their trees from this foreign disease which is threatening the elms of the State and country. Because we have not advertised the elms of this State, few people realize the part they play in beautifying the landscape. If the elms along the river in Wilkes-Barre were destroyed the loss to the city would run into tens of thousands of dollars.

Because of the importance of this meeting, it is hoped that every member who can, will make a special effort to attend. Notices giving the program will be sent out shortly.

H. G. M.

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Is the American Elm Doomed?

H. GLEASON MATTOON

JUST ten years ago Dutch elm disease was first discussed at the National Shade Tree Conference held at Cleveland, Ohio. It was called Dutch elm disease because it was carried to this country on elm logs shipped from the Netherlands. New York was the port of entry for some of the logs while others were landed at Baltimore and Norfolk. From these ports they were shipped by rail to veneering plants in Ohio, Indiana and elsewhere.

In these logs were tiny bark beetles, as well as the spores of the fungus which we call Dutch elm disease. As the cars bumped along the rails some of the beetles left the logs and flew to living elm trees along the railroad rights of way, where the female burrowed under the bark to lay eggs. Unconsciously, she also deposited in that burrow tiny spores or seeds of the fungus that had adhered to her body when she left the imported logs. These grew, filling the sap channels of the tree, thereby killing it.

In this way the disease reached Cleveland, Cincinnati, Indianapolis, Broome County, New York; Portsmouth, Virginia; Wiley Ford, West Virginia; Athens, Ohio; Brunswick and Cumberland, Maryland. Many of the logs, however, remained in the yard in New York and from these numerous bark beetles sallied forth to feast and lay eggs upon American elms of the surrounding territory. And each one left upon the elm its mark in the form of tiny disease spores, which straight way grew and killed their host.

In such a manner Dutch elm disease was disseminated to many parts of the East. Because of the alertness of federal and state pathologists, also, due to the fact that shipments to the inland places were small, most of these isolated infections have been cleaned up. Unfortunately, the bark beetles had several years in which to get in their deadly work around New York before their presence was known. By 1934 hundreds of trees had become infected, each a carrier of the disease.

Still A Chance

Notwithstanding this headstart many persons believe that Dutch elm disease could have been eradicated in the metropolitan area in two years had adequate appropriations been made. In

1934 the State of New Jersey appropriated \$5,000 while \$351,000 of Federal W.P.A. Funds were allocated with the stipulation that they must be used to employ relief labor. Without casting any reflections upon the willingness or ability of relief labor, that is not the type necessary to carry on the technical job of eradicating a foreign enemy of our trees. Since 1935 Congress has appropriated varying amounts for research studies and administration but it has been necessary to depend upon W.P.A. allotments each year for much of the scouting and eradication work with unsatisfactory results for two reasons.

First, the funds have not usually been made available until after the greatest need for them is past. It seems impossible to impress upon the Works Progress Administration that the tiny bark beetle will not wait until funds are granted before starting its depredations.

Second, when the grant is made the stipulation that 19 out of 20 persons hired must be taken from relief rolls makes it quite impossible to do an efficient job.

What Has Been the Result

From a comparatively small area in 1934 the disease has spread over 8,500 square miles in Pennsylvania, New Jersey, New York, and Connecticut. In this area, 56,338 diseased trees have been verified.

DISEASED TREES VERIFIED

	1937	1938	1939	Total to date
New Jersey	4,830	16,248	8,415	44,516
New York	1,274	1,321	1,249	10,346
Connecticut	126	535	345	1,241
Pennsylvania	0	10	199	235
Total	6,230	18,114	10,208	56,328

As the table shows, diseased elms were first found in Pennsylvania in 1938. In that year ten infected trees were discovered. During 1939, 184 diseased trees have been found in Bucks County, 25 in Lehigh, 20 in Northampton and 5 in Monroe, making a total of 234. Because of inadequate scouting, it is quite possible that other infected trees have not been detected.

The elm population of Pennsylvania is higher than most persons believe. Reasonably reliable estimates indicate that there are about 40,000,000 elms in this State. That the citizens of Pennsyl-

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Five



The Joyce Kilmer Memorial Elm at Larchmont, New Jersey, which inspired him to write the famous poem, "Trees".

vania are disinterested in the fate of these 40,000,000 trees is unthinkable.

All trees having Dutch elm disease have been cut down and burned. In addition, other nearby elms have frequently been removed in the hope that the spread of the disease may be checked. Moreover, in certain areas having numerous stunted, weak and dying elms it has been deemed advisable to remove all weak trees of this species. To date, 5,376,754 elms have been destroyed. This number is more than 20% of all the elms in the infected area.

A Gloomy Picture

Though the outlook is not bright there are

rifts in the clouds of gloom. Fortunately, Dutch elm disease does not spread as rapidly as chestnut blight. Moreover, the organization of pathologists and entomologists was set up quickly and has done excellent work. Had eradication been attacked in the same efficient manner it is possible that Dutch elm disease in this country would now be history. The administrators and supervisors have done as well as they could with the help they were required to engage.



The Joyce Kilmer Memorial Elm after Dutch elm disease got in its deadly work. 40,000,000 elms in Pennsylvania alone are facing a similar fate.

What Can Be Done

It is penny wise and pound foolish to provide insufficient funds each year. It is equally illogical to predicate the availability of much of the money upon the hiring of labor which is scarcely suited to the task. In 1937, \$4,600,000 was available from all sources for this work. If an equal amount were appropriated without strings for each of the next two years, checking of the spread

of the Dutch elm disease is probable and eradication, possible.

With such funds available a strip 50 or 60 miles in width around the infected area could be intensively scouted with a reasonable assurance of preventing further spread. Whereupon intensive eradication measures could be carried out within the infected area.

Such are the recommendations of the Pennsylvania Forestry Association. At the last meeting of the Executive Board a special Dutch Elm Disease Committee was set up to lead the fight in Pennsylvania against this disease and to save from extinction the multitude of magnificent elms that grace the highways and by-ways, the lawns and fields of Pennsylvania.

A Prize Essay

Written by 15-year-old Betty Cahoon, a Sophomore in the Mt. Carmel High School, in a Forest Fire Prevention Essay Contest sponsored by the Kingston Fish and Game Association.

PREVENT FOREST FIRES — IT PAYS

The first account of forests and their origin is found in the Bible in Genesis 1:29. Relics of ancient forests may be found in fossils.

Nature has lavishly furnished Pennsylvania with diversified forest conditions. From the earliest days when the settlers began to build their colonial homes down through the years this gift has been of untold benefit to our people and has played an important part in the development of the country.

Unfortunately many of our forest areas have decreased in number because of careless consumption.

We have passed the age of destruction and are now in the age of protection and restoration. Due to lack of vision in past generations, we are confronted with the responsibility of making amends for previous crimes committed against nature.

It is probably realized by all people that forests are necessary to the happiness, comfort and welfare of man as well as other forms of life.

Little do we, the public of today, realize the danger and expense caused by forest fires. Forest fire is the greatest enemy of the forest. As in years past it continues to be the lurking and devouring enemy. Every year people thoughtlessly drop lighted cigarettes or burning tobacco on dry twigs or leaves, and walk away without extinguishing campfires. These blazes are fanned by the wind and ignite the forest. This is just plain carelessness.

Everyone loses in the destruction caused by fire. We help to pay for the extinguishing of fires; we suffer the inconvenience and cost of floods or low water; we must drink impure water; our outdoor sports, hunting and fishing are affected.

The effect of forest fires in Pennsylvania was

recently explained by an example of the destruction of wildlife in a severe fire. The forests are the habitat of many species of wildlife. Wildlife is necessary to the maintenance of our forests as they eat harmful insects and aid in reproduction. Fires destroy the vegetation on which the animals feed.

Forest fires also destroy seeds and young trees. The future forests of Pennsylvania, as well as America, depend on the cultivation and maturity of this young timber. If these trees are destroyed, the price of lumber will increase, and the financial conditions of the population will be far worse as wood must be purchased to a certain extent since science has not yet found substitutes for some of woods most practical and valuable uses.

Forests yield a large amount of by-products which when sold help to pay the financial upkeep of the forests.

The beauty of Nature is spoiled by the "tongue" of fire. What a desolate appearance a forest has when some trees are charred, others fallen and partly rotted, dead wildlife scattered on the forest floor, and the call of the birds and the voices of the forest are silent!

That fire is the great enemy of nature is no new discovery. Thousands of years ago Joel said, "Yea, the beasts of the field pant unto thee for a fire devoureth before them and behind them a flame burneth; the land is as a garden of Eden before them and behind them a desolate wilderness." This is as true today as it was then.

Pennsylvania has spent large sums of money in its attempts to decrease forest fires. Millions of men have been employed in the Civilian Conservation Corps which is the greatest aid to Nature. These men have been building fire lanes through the forests, planting trees, and cutting out underbrush in order that danger of fire may be lessened. Forest and fire wardens are employed to watch for outbreaks of fire and send for volunteer fire fighters.

Let each one of us be a member of the Civilian Conservation Corps; for it may all be summed up by the great writer, James Oliver Curwood, when he said, "Human life is absolutely dependent upon wildlife and forests. Without these things, we would become extinct as a race."

I therefore ask you, the present leaders of our nature, and you, the future leaders, for the sake of the wild creatures of the forests; for the sake of a pure and well regulated water supply; for the preservation of timber; in fact, for the sake of humanity, "Prevent Forest Fire."

The Allegheny Forest Experiment Station

By A. F. HOUGH, Assistant Silviculturist

ON May 24, 1922, the first purchase of 74,025 acres of land within the Allegheny Purchase Unit was approved by the National Forest Reservation Commission under the provisions of the Weeks Law. From this initial purchase the Allegheny National Forest has grown to an area of 432,421 acres. Land has been bought in Warren, McKean, Forest, and Elk Counties, under authority of a State Enabling Act and with the approval of the State Department of Forests and Waters. This growth in area, rapid as it was, does little to picture the improvement in the present and potential resources of these lands through the protection and administration given by the United States Forest Service. It profits little to change the status of ownership of an area of land unless the new proprietor is willing to put his efforts into its betterment, and is able to look a long way into the future for the public good. From 1923 to 1938 the Federal Government expended \$5,442,639 for protection from fire, general administration, purchase of lands, and physical improvement of the Allegheny National Forest. Yet these figures of dollars and cents expended cannot adequately tell the values that have accrued from public ownership of these lands any more than do the acreage figures.

The distinguishing feature of ownership and administration of the Allegheny, and other National Forests throughout the Nation, is their management for the production of many different kinds of products, uses, and services from the same area. To attempt to produce wood in many forms, game animals, fish, birds, fur bearers, and other wildlife species, and, at the same time to provide watershed protection, flood control, pure supplies of water for municipalities, and to meet the needs of the public for outdoor recreation in all its various forms, is a complex and difficult job. The economic needs of the persons or communities dependent on these resources must also be considered from every aspect. All of this requires a coordination of uses and a high degree of technical planning.

Very early in the development of the Allegheny National Forest the need was felt for research into the various problems which constantly arose in its administration. How were the

mistreated woodlands to be brought back to desirable forest growth, what species should be planted on burned and cut-over or cleared lands, what methods should be used in thinning immature crops of wood and in harvesting mature crops from the forest? To what degree, the Forest wanted to know, do logging methods influence the run-off or retention of rainfall? What combinations of tree species are the most effective in preventing erosion, surface run-off, and the resulting floods? To what extent can flood crests be reduced, or low water flows be increased, through watershed management?

Other questions demanding scientific research were the propagation and control of game animals and stocking of streams to fish; restocking of beaver; porcupine control; and, above all in wildlife management, the creation of a favorable environment and food supply for the important wildlife species. Protection from fire, the development of roads, and the construction of administrative improvements and public camp grounds, are not always felt to be subjects for careful research. Yet in many instances the techniques of operation may be improved or even revolutionized by studies using the scientific method. Insect and disease control demand study.

Because these questions were being asked by foresters and owners not only in northwestern Pennsylvania but throughout the Middle Atlantic States, in 1927 the Allegheny Forest Experiment Station was created by Act of Congress to conduct research in the four States of Delaware, Maryland, New Jersey, and Pennsylvania. This Station is one of twelve Federal forest experiment stations covering the United States, and has its headquarters in Philadelphia in cooperation with the University of Pennsylvania. It is within easy reach of the five Branch Stations, or centers of field research, in its territory.

One of the first calls for the services of the new Experiment Station was, naturally, from the Forest Supervisor and staff of the Allegheny National Forest. While other studies went forward in the oak and pine forests of southern New Jersey, and a study of the growth and yield of upland oaks was carried on throughout Mary-

land, Pennsylvania, and New Jersey, technical staffmen from the Philadelphia office began work in the beech-birch-maple forests of the northern Allegheny Plateau.

This first investigation on the National Forest was of the best methods of harvesting a mature forest on a Government timber sale. Renewal of the forest by natural regrowth of seedlings and sprouts, and the development of a portion of the stand reserved from cutting, were the objectives of the sale. The study area was located on Little Arnot Creek, near Tiona. Now, ten years later, some valuable information has been obtained. Later, field studies were begun to determine the conditions under which the original and second-growth white pine forest stands grew, and the possibilities of encouraging the growth of this valuable tree species. To this end the virgin forests at Heart's Content and Cook State Forest were carefully studied, and former white pine lands were examined throughout the northern tier of counties in Pennsylvania.

Unfortunately the present Allegheny Forest Experiment Station appropriations are not equal to a full program of work in the northern hardwood forest. Moreover, they can only be used for studies of forest management. It has therefore not been possible to tackle the many economic problems of the forest, such as the best use of land based on its value for recreation, timber growing, and watershed protection, how to reduce logging and transportation costs, and to improve milling and distillation practices, etc. Nor can the Station, without additional funds specifically appropriated by Congress, attack such problems as the influence of forests on high and low water in streams from forested watersheds. Fundamental scientific problems arising out of the attempt to produce fish, game, and other wildlife in our forests, can be studied only in a minor way. Cooperation of the Federal Bureau of Biological Survey and the State Game and Fish Commissions, which have worked splendidly with the National Forest, will be sought for the Experiment Station also.

The most recent studies of the Allegheny Station within the National Forest have been conducted on an area especially designated for the purpose. In 1931 the Forest Supervisor of the Allegheny National Forest and the Director of the Allegheny Forest Experiment Station selected an experimental forest of 1737 acres, 7 miles

south of Kane. This tract has been named the Kane Experimental Forest, and is one of five experimental areas now controlled by the Station. The others are in Huntingdon County, Pa., southern New Jersey, the Eastern Shore of Maryland, and between Baltimore and Washington.

Within the past six years the experimental work at Kane has included weeding and thinning of young stands, an interesting plantation of red pines from seed collected from Maine to Minnesota, detailed climatic measurements, and fencing deer and rabbits from selected areas where natural regeneration of the forest is desirable.

With the opening of the Twin Lakes recreational area, the Lamont entrance to which crosses the Kane Experimental Forest, many local people saw for the first time some of the research work at this Branch Station. The administrative headquarters is located at the junction of the Seven Mile Road and a connecting road to Dahoga, with directional signs to show the way. Since the untimely death this winter of Resident Superintendent Ackerman, M. J. Harding is in residence, and will be glad to explain the various research studies to visitors.

TREE PLANTING ON FARMS HAS DOUBLED SINCE 1935

Farmers have more than doubled their tree-planting activities since 1935, according to a report of the U. S. Forest Service. A total of 55,359,728 trees was distributed during the calendar year 1938. Approximately 41,700,000 trees were distributed in 1937, 35,600,000 in 1936, and 26,150,000 in 1935.

The Clarke-McNary Law, passed in 1924, provides for the allotment of federal funds to states matching such appropriations for carrying on fire protection work in forests and for furnishing forest tree seedlings for plantings on farms. Expenditures by the federal government during 1938 in this program were \$75,286.33; the states spent \$306,910.33 on the cooperative project.

A total distribution of 7,036,000 forest tree seedlings by Georgia gave that state the lead in the nation during 1938, with New York taking second place with distribution of 5,610,000 trees, and Pennsylvania third with 4,347,000. Other states which distributed more than 3,000,000 trees include Arkansas, Florida, South Carolina, Tennessee and Wisconsin.



A Penn Tree Seedling Is Planted

By

BERTHA REISELT, SHIRLEY WALTON, MARTHA SCOTT

(Three Pupils of the A. H. Shaw Junior High School)

ON the afternoon of William Penn Day, October 24, 1939, eight hundred high school students and teachers gathered in Fairmount Park, Philadelphia, half way between Belmont Avenue and Horticultural Hall. They came at the invitation of the Schools Committee on Penn Memorials to honor William Penn on the occasion of the 250th anniversary of his coming to America. Mr. Morris E. Leeds, President of the Board of Education, presided and introduced the speakers, while a band in red uniforms of the Simon Gratz School rendered excellent music. Every senior and junior high school in the city, every Catholic high and all private high schools in and around

the city were represented. The ushers from Friends Select School, William Penn Charter, Westtown, George School, Germantown Friends, John Bartram and William Penn High Schools were in quaint colonial Quaker costumes. The cadets from Girard College and other schools added their uniforms to a background of autumn foliage.

Following the singing of "America," led by Mr. Lindsay, Dr. Edward E. Wildman presented the tree. He told of the many men and women who have taken much time to trace the old trees that stood in Penn's Woods 250 years ago. Many of these have been marked and preserved for us.

They stand a reminder of those who braved the wilds to make it safe for us. Each tree marks an epoch in Penn's life. One in particular, he said, was the great white oak in Bucks County, from under whose branches the Indian Purchase Walk started in 1737. A tiny acorn from that tree was planted in a nursery and has there grown for seven years, until it is now nine feet tall. We are planting it as a memorial to Penn and what he stands for.

Mr. Baxter, Landscape Gardener of Fairmount Park, accepted the tree on the 295th anniversary of Penn's birth. It is in a grove set apart for memorial trees which will be planted to honor men and women for outstanding accomplishments. May we benefit by the trees as by the lives they honor.

Following Mr. Baxter, Dr. Walter W. Haviland, Headmaster of Friends Select School, spoke of Penn. Two hundred ninety-five years ago in the shadow of the Tower of London a baby was born and named William Penn. His father was an Admiral in the English Navy, serving under Cromwell. Young Penn was well educated, travelled on the continent, and spoke French, German and Dutch equally well with his English. He knew the distinguished people of the European Capitols. He was a personal friend of King Charles II and King James II. When 23 years old he gave up his home and friends to join a group of Quakers. Led by that spirit, he became the greatest American Colonizer. He was a diplomat, equal to Franklin, an athlete capable of winning the praise of the Indians, a writer of 157 books and in some he quotes 122 authorities. He wrote thousands of letters when letter writing was not a habit and 1,600 are still in good condition.

Penn was broad-minded and a strong supporter of liberty and justice. He was a Christian with a vast fortune. No undertaking was too great and no injustice too small for him to attack. He had great ideals and tried to promote a United States of Europe. In 1681 he secured a grant of land from the King, assuring all who came here of religious liberty, justice and education. In 1683 the first school was opened with Enoch Flower as teacher and in 1689 a group of Quakers founded Friends Select and Penn Charter as monthly meeting schools. William Penn had money to provide arms and men to protect the people, but he refused, calling the Indians his friends. He promised that no descendant of his

colony would ever harm an Indian. This treaty, "the first never sworn to and never broken," was made under an elm tree in the northeastern part of this City.

The next speaker was Dr. Alexander Stoddard, Superintendent of Schools. He said that he had learned three things from this gathering and would impress these facts upon us by repeating them. First, Penn was a man of the world with interests in religion, art, music, nature, politics, and mankind. Second, he taught that war never had and never will settle world problems. Third, he always refused to use his power or influence to gain his own end.

Further Dr. Stoddard added the planting of the tree means little to us now, but in future years we will hold this gathering as a precious memory. As we pass this oak years hence we will rededicate ourselves to the principles taught by Penn.

Following Dr. Stoddard, school representatives formed a line in the order of their founding. While one carried the school banner around the tree his companion emptied a cup of soil on the roots, supplied by a boy in a Quaker costume, representing John Bartram. In this way representatives from every school assisted in the dedication.

The Reverend John Bonner, Superintendent of the Catholic Schools, extended greetings and expressed his appreciation in having a part in this great day. His benediction was Penn's Farewell Prayer for the colonies as he sailed away, leaving it in the hands of his God.

WHERE THE FORESTS ARE

According to Frank E. Lathe, National Research Council, Ottawa, Canada, in an article "World Natural Resources," Science Magazine of October 14, 1938, about two-thirds of the world's total forest resources are in possession of four of the world's political units, the U. S. S. R., the British Empire, Brazil and the United States.

The world's annual growth of wood is about 38,000,000,000 cubic feet. If all forests of the world were properly protected and given reasonable care, it is estimated that they could produce annually 350,000,000,000 cubic feet. It is thus evident that an appreciation of the seriousness of the situation, coupled with the general application of scientific methods of forest protection and growth, would provide for the needs of a population much greater than that of today.

Forestry and the Coal Region

(Continued from Page 2)

the predominating forest types satisfy the species requirements. Over one-quarter of the total wood consumption need not even be sawed, nor straight, nor of large diameters, nor seasoned, nor necessarily free from defects if these do not reduce strength.

To the heretofore most pressing problem of the coal industry—the loss of coal markets—has been added one equally serious: The control of water which in various ways is entering the mines in such increasing quantities that soon many mines may be abandoned to the water. Already some operations must pump as much as seventy tons of water for every ton of coal they remove. While a huge pumping task is accepted to be an important factor in coal production, the real problem is to cut down the amount of water that must be handled *at any one time* since this reflects in the amount of equipment that must be installed. It therefore follows that some water that ordinarily would flow freely into the mines through surface breaks, fissures, or caves must

either be diverted to stream channels to be carried swiftly away, or induced by every possible means to seep downward naturally—and consequently slowly—into the mines at a rate within economical pumping facilities. This Committee thinks that such natural seepage can be greatly encouraged by improving the condition of the forest floor, which on most mine surface lands is now in poor shape indeed.

In the same manner, the condition of the land surface has exerted an unquestionably unfavorable influence upon the behavior of the Susquehanna, Lehigh and Schuylkill Rivers. Floods have been frequent, and have caused loss of life and severe damage to ratables on the flood plain. Immediate protection can be achieved by engineering devices. Their cost is high, but the effect is immediate and easily measured. Basically, however, the future need for expensive reservoirs which do not reduce the losses sustained above them will eventually diminish if surface cover is properly restored and zoning on the flood plain is established.

Flood conditions are further accentuated by the heavy siltation from the erosion of mine-refuse banks and silt-choked stream banks and breaker wash. Silt and culm jeopardize the water supply



PHOTO U. S. FOREST SERVICE

Barren, idle area adjoining Wilkes-Barre. Such areas are very common throughout anthracite communities. A plantation of conifers here would brighten the community.

for domestic and industrial consumption in the large metropolitan areas adjacent to the anthracite region and also preclude any possibility of fish life. The City of Philadelphia and the United States Engineer Corps annually spend about \$300,000 in dredging the culm silt out of the Schuylkill River.

The recreational appeal of the anthracite region to internal and outlying metropolitan areas can hardly be overestimated. Although its location and its scenic qualities make the region a potential playground, this aspect has been neglected and even discouraged. What recreational areas are now developed are much too far away for greatest use.

Forest Restoration. The anthracite forests must be rebuilt and the task must necessarily be based on careful planning and coordination. Some of the more important steps that are clearly evident at the present time are:

1. More adequate protection from fire, insects and disease.
2. Elimination of destructive logging practices.

3. Reforestation of barren areas, particularly those surrounding or within anthracite communities.

4. Afforestation of mine refuse banks.

5. Public purchase of areas where needed for recreation, or areas so depleted that restoration will be a long-time proposition.

6. Establishment of an Anthracite Region Forest Experimental Station to supply the data on which to proceed.

Summary and Conclusion. This Committee finds on the one hand a vast amount of available labor, and on the other a big job to be done. Both public and private interests are involved. Although each is unquestionably willing to admit the work is necessary and desirable, need for correlation is evident, and this Committee strongly recommends that the Allegheny Section of the Society of American Foresters cooperate with all agencies, public and private, which are working to create stable, local employment, increase sub-surface water storage, prevent erosion, insure dependable water supplies, provide local timber needs and promote conditions favorable to wildlife and recreation.



PHOTO U. S. FOREST SERVICE

Loading deck at mine colliery timber yard. This is at the Susquehanna Collieries Co., Glen Lyon, Pa.

Scenic Trail Development

STANLEY MESAVAGE

Boy Scout Field Commissioner In Charge of Forestry Relations

OUTDOORS folk reasoned that a hiking trail encircling the Wyoming Valley would be a worth while development. In 1934 the plan was discussed at some length and finally approved by the Executive Board of the Wyoming Valley Council of Boy Scouts. Districts were created and Deputy Forest Commissioners were appointed for each one. The problems were solved as quickly as possible regarding the assignment of troops, location of the trail and methods for carrying out the work. The field work was then turned over to the Deputies who worked out the final details for each district in close cooperation with the Scout officials.

Since that time all landowners have been approached and permission secured either in writing or verbally. In most cases the land owners looked upon the trail in the form of added advantage for increasing the fire protection. No fires are permitted on the trail without the approval of the Forest Commissioner.

The trail traverses the mountain tops consequently no trouble was experienced in locating the general course except in section where scrub oak was dense. All scenic, historical and forestry points of interest were marked and the trail routed accordingly. Not more than one-half mile was blazed or assigned to a troop regardless of the number of boys in the troop. Weekend hikes are held by the Deputy and as many as two to four troops called out at a time. On the trail, the Deputy served as chief of the party while the scouts paced and blazed the course as they went along. By this method the scout receives training in pacing, use of knife and axe, trail blazing, trail locating, and many other lessons in nature lore, cooking, hiking, pathfinding, pioneering, forestry and conservation.

After each troop has a section blazed the next procedure is to begin the work of cutting out the brush. Like an army of CCC workers the Scouts tackle the job with fire rakes, axes, mattocks and many weird looking implements. Since old trails were taken advantage of, little cutting was necessary in some sections. The trail width of five feet permits free walking. All inflammable material such as brush and dead logs is

piled 25 feet distant. Because of the hazard of forest fires, no burning of brush is permitted; instead rabbit and bird covers are constructed and all material utilized. All stumps are cut low and in many cases the roots grubbed out. As many boulders as possible are removed from the path. Limbs from overhanging trees are pruned to a height of six to eight feet.

The Scouts are cautioned to be extremely careful with the use of sharp tools.

The trail will be of lasting interest and benefit to the future scouts and the people of the Valley in general in their camping and outing plans. Every new Scout troop will be given an opportunity to be represented on the trail. Since the trail involves an approximate length of 75 miles, this huge undertaking will be one of the main projects of the Wyoming Valley scout program for some time to come.

AMERICAN ELM BESET WITH ANOTHER EPIDEMIC KILLER

This country's most esteemed shade tree, the American elm, is now beset with another epidemic killer, a virus disease. Pathologists in the Federal Bureau of Plant Industry find it has killed thousands of elms in the past few years in the middle and lower Ohio Valley. First indications of the disease are a slight shriveling and brittleness of the leaf, accompanied by a rotting of the roots and the inner bark of the trunk. Within a few months the tree may be dead.

This is the first time a virus disease has become an epidemic killer on forest or shade trees in this country. When the Bureau specialists could find no organism responsible for the disease, they proved it a virus by grafting scions from diseased trees to healthy trees. In a number of cases the healthy tree was infected. The proof that such a disease—in which the organism or causal agent cannot be filtered out or seen under the microscope—will kill forest and shade trees in an epidemic way may open a new field in the study of tree diseases. They hope next to determine how the virus is spread and what may be done to combat it.

Our Wissahickon Valley

(Continued from Page 3)

The Indians gave the name of Miquon, meaning a quill, to William Penn. That name has been given to a village on the Schuylkill above Roxborough.

After the Swedes left the neighborhood, the German and Dutch settlers came with Pastorius to Germantown and the various Pietist groups soon found their way to the Wissahickon, Kelpius and the Rosicrucians settling near Hermit Lane. The Brethren drew their congregations to the Monastery and in the pool near Kitchen's Lane bridge many were baptized.

The Mill-Owners

The mill-owners, who took over the Valley soon after the German and Dutch settlers, made their own roads down to the stream from Roxborough, Germantown or Chestnut Hill and for long crossed the water on the crest of the dams they built to run their waterwheels. It is said there were about 25 mills on the six miles of the creek now in Fairmount Park. Many of the names of the mill-owners survive in the lanes and roads now leading to the Valley, Thomas Mill Road, Bell's Mill Road, Leverington Avenue, Gorgas Lane, Livezey's Lane and Rittenhouse Street. Other roads now crossing the Creek on bridges bring back to us the land-owners of the neighborhood, Kitchen's Lane, Allen's Lane, Rex Avenue, etc.

The high rocks near the entrance of the Valley played quite a part in the Battle of Germantown, October 4th, 1777. The British under Lieutenant-General Knyphausen engaged in a skirmish with General John Armstrong between School House Lane and the Reading Railroad—on the west side of the Valley. The latter general reported to his commanding officer, then in Lancaster, that his men were struggling through the "horrendous woods of the Wissahickon." This was quite near Hermit Lane named from Johannes Kelpius the German Pietist—whose cave and spring can still be found not far from Henry Avenue bridge and the Park Nurseries.

The Wissahickon Turnpike

In 1826 the rocks at the entrance to the Valley were blasted away to admit a roadway from Ridge Avenue and gradually the Wissahickon Turnpike was built to the edge of the city at

Northwestern Avenue, connecting all the mill sites along the Valley. Many of the mill owners had their homes on the Creek. The old Livezey House, said to have been first built in 1696 and enlarged later, the Rittenhouse home on Paper Mill Run, and the fine Robeson house on Ridge Avenue are still remaining. Many others were destroyed.

Then came the roadhouses to entice the people driving out from town and the suburbs. Wissahickon Hall was built in 1849. It is now the Park Guard headquarters. The Indian Rock Hotel at Rex Avenue, Maple Springs, The Lotus Inn, the second Indian Rock Inn at Monastery Avenue and Valley Green Inn now the only Inn remaining, were all built as the turnpike was extended.

The Park Commission Takes Possession

In 1868 the far-sighted Park Commission, under Eli Kirk Price, the elder, by Act of Assembly, agreed to buy up the Valley for Fairmount Park extending the purchase to the crest of the hills on either side. Fortunately for many of the present land-owners on both sides of the Creek who value their homes greatly, the Park only extends part way up the slopes in many places. That struck the death knell of the mills for they were taken down and soon the growth of trees, ferns and lichens covered every vestige of mill races and stone walls. Except at Livezey Mill and the Megargee Mill nothing remains. Through all these changes the beauty of the forest was not disturbed. The path on the east side of the creek was made and with its overhanging rocks and great forest trees enticed many pedestrians from the neighborhood. The Park Commission, to their everlasting credit, sturdily resisted all endeavors of the autoists to allow automobiles along the drives. They kept the paths and roads in good order and the bridges strong, but with decreasing support from City Councils were unable to attend to the necessary forestry work that such a noble forest demanded. Fallen trees and brush cluttered up the stream, dead and dying hemlocks lay in great disorder all through the forest and replanting was almost neglected even though the Park Nurseries were full of fine young trees of the right size to transplant.

The remainder of this interesting article by Mrs. Day will be published in the next issue of FOREST LEAVES.

Our Program

1. The adequate protection of all Pennsylvania forests from Fire, Fungi, and Insects.
2. The personnel of the Department of Forests and Waters to be chosen and retained on a basis of efficient service only, in order to guarantee permanency of policy and continuity of action.
3. The management of the State forests so that they may supply the permanent needs of the people not only for continuous timber protection but also for recreation, hunting and fishing.
4. Greater co-operation between the departments of the State Government for protection of the beauty of the public lands.
5. Adequate biennial appropriations for the purchase, protection, and development of the State forests.
6. The education of the public, corporations, sportsmen, and forest land owners with respect to the value of our forests and the necessity for their development and proper utilization.
7. The planting of trees valuable for lumber on all waste and idle lands and the continued distribution of seedlings by the State.
8. The education of our children in forestry in both public and private schools. A love and appreciation of the forests tend to a better type of citizenship.
9. The establishment of town and county forests which will bring pure air, pure water, and recreation close to the centers of population.
10. The preservation of the few remaining areas of virgin timber in Pennsylvania.

THE PENNSYLVANIA FORESTRY ASSOCIATION

Organized in 1886

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FOREST LEAVES, the Association's magazine, is sent to members in all classes. Our program will be found on the inside back cover.

FOREST LEAVES



THE PENNSYLVANIA FORESTRY ASSOCIATION

MARCH - APRIL
1949

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THE PENNSYLVANIA FORESTRY ASSOCIATION

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Labors to disseminate information in regard to the necessity and methods of forest culture and preservation, and to secure the enactment and enforcement of proper forest protective laws, both State and National.

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One Dollar of which is for subscription to FOREST LEAVES

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What About the Schuylkill River?

By HON. GROVER C. LADNER

THE late Justice Oliver Wendell Holmes in one of his masterly opinions said, "A river is not a mere amenity, it is a treasure." I write of the Schuylkill River—a treasure ruined by the devastating hand of man.

Picture the Schuylkill of yore. Its two branches rising in the foothills of the Alleghenies flowing toward Port Clinton where their crystal clear waters combined into a splendid river winding through the rest of its fertile valley until it joined the mighty Delaware at Philadelphia. In those days the river was a joyous sight. On its bosom rested water fowl, through its waters plowed boats of inter-city commerce. From it was drawn water supply for farm and town. It furnished healthful recreation for man and child. It teemed with fish. Watson's Annals said, "Rock fish, perch and catfish were so plentiful that 3000 could be caught in one night with a dip net. Shad came up the Schuylkill in such numbers that seven could be taken out at one scoop of a dip net. Many men in the vicinity of the falls of the Schuylkill during the shad season—lasting three months—made enough by catching shad in a simple hoop or dip net to support their families for a whole year. One sweep of the seine was known to catch 435 shad, providing a cheap but wholesome food for the people of the whole valley." A man out of work *then* could with little effort catch enough fish to keep his

family from starvation. The flowery banks of the Schuylkill were immortalized by the Irish poet, Tom Moore, in his verses on leaving Philadelphia.

Came the discovery of coal. The forested mountains were torn asunder, the green hills opened into ugly mines; soon the two branches of the Schuylkill became dirty and foul; instead of clean water they poured into the main river tons upon tons of coal culm and silt, until the once beautiful stream became a black filthy sewer.

Thus the majesty of nature departed, and the tragedy of pollution now holds sway. Arrogance unrestrained defies public will. License privilege, graft, greed, or progress itself, if you please, has robbed the people of this valley of their birth-right. And all so unnecessary for the mines *could* have been and *can* be operated here, as abroad, without ruining the waters of the State. Today we see the result, a black, filthy stream which birds of the air, beasts of the field, and fish of the sea shun. The river has been so shallowed that it is incapable of carrying the freshets; again and again it floods its banks, damaging towns and factories to the extent of hundreds of thousands of dollars annually, leaving on its once flowery banks the dirty deposits of coal silt. Burdensome expense has been placed on the water works in Philadelphia, Norristown, Pottstown, Phoenixville and other cities of the Valley. Children cannot play near nor bathe in its waters. Boats cannot ply through it, except in limited areas. Then having permitted it to be wellnigh ruined, callous authorities suggested it be left to its fate as an open sewer.

BIOGRAPHICAL NOTE: Judge Ladner, who was Deputy Attorney General from 1935 to 1937 assigned to the State Conservation Department, has been for many years a militant advocate of stream purification and is fully conversant with the subject. He is President of the Schuylkill River Valley Restoration Association of whose aims he speaks in this article. In January, 1939, he was awarded the State's Meritorious Service Medal for Distinguished Service in the cause of Conservation.

A vigilant band of conservation minded citizens rejected such suggestion. They claimed the



Culm pile protection work by the W. P. A. now discontinued. Small tributary now flows clear and clean. Nature will reforest the culm bank.

river was not beyond redemption. The Federal Government's aid was enlisted to prove the case. An appeal to Congress brought a comprehensive survey by U. S. Army Engineers who reported: first, that the Schuylkill can be cleaned; second, how it can be done; and third, the cost of doing it. I summarize that report.

It finds that the river's condition is largely due to the large volumes of coal silt which for years have been allowed to enter the headwaters of the river. These have moved progressively down stream, silting up the channels, destroying their value for navigation and recreational use, and increasing flood hazard. The sources of these wastes are two: (a) from the active collieries and coal preparation plants, and (b) from the erosion of the great accumulation of coal waste in dump piles from past mining operations.

The plan recommends, as to the first source, that the State compel those active mines that have not already done so, to provide measures for settling out process waters used in washing and preparing coal. The fine coal thus reclaimed is readily marketable so that the process will prove profitable. In some cases the process water can be discharged into abandoned mine workings without cleansing.

So far, the Sanitary Water Board has dis-

played no interest in compelling obedience to the State pollution laws. The fact that this board which under previous administration always met at least monthly has so far met only once in the first twelve months of the James Administration, indicates that this board is not disposed to function at all. This despite the platform promise of the party in power which pledged the people enforcement of the Pure Streams laws.

The second source may be prevented by constructing dry masonry retaining walls along the bases of the old dumps, to retain their toes and prevent under cutting by streams; by the shifting of some stream channels and by revetment of banks. Twenty-four separate units were planned at an estimated first cost of \$2,433,000, of which amount all work located in Schuylkill County was authorized in 1936 as WPA projects to a total cost of \$2,160,771. Half of this work has already been done.

Unfortunately, due either to a false sense of values, or perhaps political maneuvering, the present administration has refused to provide the \$125,000 sponsorship funds required by the Government thruout the United States as to all unexpended WPA funds, and thereby relinquish-

(Continued on Page 12)

The Task for a Central Forest Seed Laboratory

DR. HARDY L. SHIRLEY



Upper photo: Stand of Scotch Pine near Ehersville, Germany. Seedlings from Rhine Valley source.

Lower photo: Same species planted from East Prussia seedlings.

IT is a source of gratification to every American proud of his heritage, that our country is making a large-scale effort to restore abandoned farm land and fire-scarred, cut-over areas to forests, especially since in this effort forests are being restored not only for the purpose of producing timber for saw mills, but also to provide cover and food for game, protection and improvement of soil, a source of income for communities and settlers, shelter for man and beast, and healthful recreation for everyone.

Last year more than 222 million trees were planted on the National Forests alone, each of which had to be grown from seed. Many tons of forest seed are collected each year in America and as much as 50,000 pounds imported, a large part of which is used in private nurseries.

America is more richly endowed with useful tree species than any other large industrial country. We need only to learn how to propagate these many species on a large scale, to give us an outstanding advantage in our reforestation efforts. But some of these seed have tough outer coverings which shed water like a duck's back, others have hard or impermeable seed coats, still others have dormant or undeveloped embryos and not infrequently all these difficulties are encountered in a single seed. When sown, such a seed may germinate intermittently over a period of two years or more, unless proper treatment is applied beforehand. Successful treatments have been discovered for a few species but the large majority still await investigation.

As every farmer knows, not all varieties of wheat are the same. Some must be sown in the spring, others in the fall, some give high yield and are resistant to rust, cold, and drought, others are susceptible and low in yield. Similarly, different strains or races occur in many forest trees, but only a few American species have been investigated. It is known that green ash from different portions of its range exhibits wide differences in growth habits and drought resistance. Douglas fir seed collected in the mountains of Colorado will not produce the fine specimen characteristic of the coastal region of

(Continued on Page 11)

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MARCH-APRIL, 1940

THE SPOILS SYSTEM

TIME was when the personnel of the Department of Forests and Waters was exempt from political manipulation. In those days capable administration of state forest lands and adequate fire protection for all forested areas in the state was deemed of greater importance than the political affiliation of the employees of the department.

Over 35,000 fire wardens and crew members are in the employ of the Department of Forests and Waters. Upon their experience in fighting fires, careful organization and intelligent direction depends the success of the forest fire extinction campaigns each year. Demoralization of this fire fighting organization through dismissals for political reasons has cost the citizens thousands of dollars.

It is common gossip, not without substantiation, that many fires are set intentionally due to resentment because the men were fired who would not support the party in power financially or by ringing door bells. It is the cheapest kind of politics to hold such a club over the head of a man who frequently earns less than \$50.00 a year as a fire crew member.

By the same token the tenure of foresters and other technical men should not depend upon the

whim of some county political boss with no conception of the requirements of the position or scope of the department.

Intelligent management of the 1,650,000 acres of forest land under control of the department has been a farce, largely because no long range program can be adopted and executed while partisan politics rules.

H. G. M.

PEDIGREED SEEDLINGS

SINCE announcing in the October, 1939 issue of FOREST LEAVES, that The Pennsylvania Forestry Association has been collecting acorns from some of the finer specimens of "Penn's Trees," and is now prepared to distribute seedlings, inquiries have been received from New England to Alaska. The interest in this simple means of trying to perpetuate the inherent qualities which enabled these patriarchal trees to live for 300 years is noteworthy.

Yet the results of forest tree breeding for specific qualities, should, over a period of years, be as beneficial as has the work which has been done with fruit trees. The time may come when trees will be bred for their resistance to diseases and insects, for specific wood qualities or for specific root or foliage qualities.

The reason such research has not been carried on in the past, may no doubt be found in the multitude of tree species native to the United States and to the belief that our timber supply was inexhaustible.

H. G. M.

DUTCH ELM DISEASE

The response of the citizens of Pennsylvania to the appeal sent out by the Association for support in our campaign for adequate funds for Dutch elm disease research and eradication has been most gratifying. But the battle has only begun. The area of infection is relatively so small that congressmen from but a few states are conscious of the seriousness of this exotic enemy of the American elm.

Moreover, a member of congress is literally swamped by mail from his constituents on a multitude of subjects. Our appeal therefore must be greater and more forceful than most of the others, or it will receive little or none of his attention. The basis of the appeal should be the wastefulness of WPA allotments as made in the past for those phases of the eradication project which require experienced men.

Annual Meeting at Wilkes-Barre

Splendid Local Support Contributes To Success of Coal Region Meeting

ACTIVE interest in forestry and the program of The Pennsylvania Forestry Association by the citizens of the anthracite region was demonstrated by the large attendance at the Annual Meeting of the Association held at the Hotel Sterling, Wilkes-Barre, on February 27. A luncheon meeting at which we joined the Rotary Club of Wilkes-Barre started the day's activities with an attendance of 125. James H. MacVeigh, President of the Rotary Club, presided and introduced George H. Wirt, Chief Forest Fire Warden of Pennsylvania, who spoke on "The Citizen's responsibility During the Fire Season." Mr. Wirt said in part:

"The Forested area within the Anthracite field covers approximately two million acres. These two million acres of forest land, as far as physical conditions are concerned, are not very different from any other two million acres of forested land within the state of Pennsylvania. Yet

on the average within the limits of the two million acres within the Anthracite field, anywhere from two to three times as many forest fires occur every year as occur in any other two million acres of forest land within the Commonwealth. Since the natural forest conditions are approximately the same, and since 99% of the origin of forest fires is from the people who frequent the forest areas, we have two very definite implications with respect to the attitude of the people within the Anthracite region. The first is that the people of the region do not appreciate the value of the forest areas and the second is that the people of the region are exceedingly more careless with fire than would appear to be the case with people of other regions of the Commonwealth. This trend brings out very definitely the idea that in the forest fire situation the problem is not simply one of handling forests and fire, but the larger part of the problem is a matter of dealing with people.

"It is a very definite fact that no owner of forest property can monopolize the beneficent returns from that property. Even though he might not want the community to receive benefits from his property, he can't prevent that benefit from falling to the community. And even though a community may not recognize the fact that it receives benefits from such privately owned property, that also does not change the situation. From this standpoint it is very definite that the protection of forest property from fire in any region is a matter of cooperation between the land owner and the community.

"Any good government, as we profess our government to be, is set up for the common and contented welfare of those of us who are here, while we last, and of those who come after us. Good government is a matter of perpetuating our own welfare. It is self-evident, therefore, that if we want to continue our own wel-

fare within the Anthracite Region, there is only one answer to the question of the responsibility of citizenship with respect to forests and their protection. That answer is that every citizen must do his part to protect every acre of forest which still remains, and to rebuild every possible acre of forest that can be built within the Anthracite field."

Business Meeting

At two o'clock the Annual Business Meeting was called to order by President Wilbur K. Thomas, who in his opening remarks spoke of the fact that this was the first annual meeting of the Association ever held outside of Philadelphia. He expressed the hope that this departure from precedent would be continued, going first to one section of the State and then another.

The President first called upon Mr. Edward Woolman, Chairman of the Finance Committee, to submit Mr. Wright's report in his absence.



FIRST PRIZE POSTER, BY PETER TIMKE, A JUNIOR IN NESQUEHONING HIGH SCHOOL

Treasurer's Report

Receipts and Disbursements for year ended December 31, 1939,

RECEIPTS:

Cash Balances:

December 31st, 1938.

The Cheltenham National Bank	\$ 104.43
Petty Cash	10.00

Receipts:

Dues 1938	33.00	
1939	1,346.00	
1940	97.00	
Forest Leaves	37.50	
Advertising	9.25	
Miscellaneous	41.85	
Dutch Elm Disease	165.00	
Contributions	580.00	
Seedlings	39.00	
Interest—Birkinbine	1,829.87	
Interest—Investments	388.19	
Transfer from Investment Account	2,731.49	7,298.15
		<u>\$7,412.58</u>

DISBURSEMENTS:

Telephone	\$ 152.50	
Forest Leaves	693.65	
Expenses—Traveling—Secretary	723.82	
Disbursements:		
Miscellaneous	102.43	
Bookcases—Offices	47.00	
Postage	228.87	
Stationery and Printing	286.84	
Office Expenses	116.79	
Rent	355.00	
Salaries—Secretary & Office	4,282.00	6,988.90

Cash Balance:

December 31st, 1939

The Cheltenham National Bank	423.68
	<u>\$7,412.58</u>

INVESTMENT ACCOUNT RECEIPTS AND DISBURSEMENTS

Cash Balance:

December 31st, 1938

Western Saving Fund Society	\$ 532.48
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Receipts:

Memberships		
Miss Mabel L. Gillespie	\$ 20.00	
A. E. Braun	20.00	
Eli K. Price, III	20.00	
Dr. Daniel Longaker	20.00	80.00
Interest—Deposits		23.26
Payment of Mortgage — Birkinbine et al.		\$12,150.94
Bequests—		
Louise A. McDowell	90.00	
M. H. Hansen	3,000.00	3,090.00
		<u>\$15,876.68</u>

Disbursements:

Securities Purchased	\$11,629.14
Interest Paid	30.05
Interest—	
Transferred to General Fund	11.84
Transfer of Funds to General Fund	2,731.49
	<u>\$14,402.52</u>

Cash Balance:

December 31st, 1939

The Cheltenham National Bank	1,474.16
	<u>\$15,876.68</u>

The Secretary in his report discussed the progress in fulfilling some of the planks in the Five-Year Forestry Program of Pennsylvania adopted in 1937. His report was in part as follows:

"Three years ago a carefully prepared 'Five-Year Forestry Program for Pennsylvania' was adopted by the Association. Comment on some of the items of this Program is in order:

1. Purchase by the State of such tracts as the Kitchen Creek area in Sullivan County and the Silver Lake forest in Susquehanna County should be actively advocated at the 1941 session of the legislature. Containing stands of virgin timber and having exceptional scenic and recreational value, these two tracts should be added to the holdings of the Department of Forests and Waters, to be developed for the use and enjoyment of the public. The Kitchen Creek tract being only about 30 miles from the thickly populated centers of Luzerne and Lackawanna counties would provide an accessible recreational area of considerable size and exceptional merit for over 600,000 persons.

2. One item in our program is as follows: 'Addition to the state appropriations for the Department of Forests and Waters to make possible the allotment of not less than \$390,000 a year for intensification of fire protection, particularly in the anthracite coal regions and other portions of the State having a high fire hazard, combined with great recreational possibilities and pressing need for protection against erosion and the surface run-off of rain and melting snow.' Previous to 1937 the legislature had appropriated \$200,000 for fire protection. In 1937, this was cut to \$150,000. Again in 1939, the legislature appropriated only \$150,000. Due to the unusual number of fires in 1939, there remains less than \$50,000 to cover the next three fire seasons. The result is that less protection can be given or the fire wardens and crew members will have to wait months for their pay. I

recommend that the President appoint a committee to confer with the proper officials. A solution should be found. Greater rather than less protection is needed and the State cannot in fairness make fire wardens and crew members who depend for their livelihood upon the meagre pay they receive, wait until the 1941 session of the legislature for their money."

Next in order was the election of officers, members of the Executive Board, and Council. Few changes were made. However, two new Vice-Presidents were elected: J. Curtis Platt, Vice-President of the Scranton-Lackawanna Trust Company, Scranton, and Dr. J. R. Schramm, Head of the Botany Department of the University of Pennsylvania. Ralph P. Russell, Haverford, was newly elected as a member of the Executive Board. The Association is favored by the willingness of these men to give of their time and experience to aid in this work. The result of the election is as follows:

Honorary President, Sam. L. Smedley; President, Wilbur K. Thomas; Honorary Vice-President, R. S. Conklin; Vice-Presidents, F. R. Cope, Jr., Wm. S. B. McCaleb, J. Curtis Platt, E. C. M. Richards, Dr. J. R. Schramm, Dr. E. E. Wildman, George H. Wirt, Edward Woolman; Secretary, H. Gleason Mattoon; Ass't. Secretary, M. Claire Burlingame; Treasurer, Roy A. Wright.

EXECUTIVE BOARD: Victor Beede, E. F. Brouse, Reginald D. Forbes, Ralph P. Russell, Philip A. Livingston, Francis R. Taylor.

COUNTY COUNCIL MEMBERS: Allegheny—Dr. O. E. Jennings, Frank J. Lanahan, J. O. Langguth, Thomas Liggett, John C. Phillips; Berks—Miss Mary Archer, George B. Hiester, Rev. Lee M. Erdman; Blair—Harry F. Beegle; Bradford—Miss M. S. Maurice; Bucks—Mrs. Irvin M. James, David Burpee, Helen H. Ely; Cambria—P. L. Carpenter; Cameron—Josiah Howard; Carbon—A. C. Neumuller; Centre—Robt. C. Auker, Victor Beede; Chester—Albert L. Bailly, Jr., Frank B. Foster, Arthur E. Hutchinson, Robt. G. Kay; Chester—Mrs. Paul Lewis, Robt. C. Liggett, E. C. M. Richards; Clarion—H. M. Amsler, M. M. Kaufman; Clearfield—W. F. Dague; Cumberland—W. Gard Conklin, Sherman Jones; Delaware—Prof. H. K. Henry, S. J. Henderson, Edwin A. Hoopes, Dr. J. R. Smith, Dr. J. C. Starbuck, Grahame Wood; Dauphin—R. Lynn Emerick, James McCormick, Jr., J. Horace McFarland; Erie—Dorothea Conrad, Glow G. Taylor.

Franklin—J. A. Aughanbaugh, H. H. Chisman, Fred W. Shearer, Jesse H. Thompson, Theo. W. Wood; Huntingdon—T. Roy Morton, Mrs. C. M. Taylor; Indiana—D. C. Lefevre, S. J. Sides; Jefferson—G. W. Alexander, W. N. Con-



At the Banquet. Seated: H. B. Rowland, H. Gleason Mattoon, Judge E. Foster Heller, R. D. Forbes. Standing: Col. T. H. Atherton, Edward Woolman, George H. Wirt and Edward J. Quinn.

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rad; *Lackawanna*—John G. Hill, Nicolai H. Hiller, J. Curtis Platt, H. C. Reynolds, Col. L. H. Watres; *Lancaster*—Miss Mildred J. Jones; *Lebanon*—Wm. C. Freeman; *Lehigh*—Dr. M. J. Backenstoe, H. S. Snyder; *Luzerne*—Col. T. H. Atherton, Cornelius B. Kunkle, Stanley Mesavage, Samuel D. Warriner, Mrs. C. M. Young; *Lycoming*—Henry E. Kirk; *Mercer*—N. G. Brayer; *Mifflin*—F. W. Culbertson, F. H. Dutlinger; *Monroe*—J. A. Seguire; *Montgomery*—Mrs. A. C. Barnes, Fred J. Doolittle, Philip A. Livingston, Ralph P. Russell, Francis R. Taylor, Mrs. Robt. C. Wright; *Northampton*—Prof. R. W. Hall; *Northumberland*—Charles Steele; *Perry*—Benjamin McPherson; *Philadelphia*—Samuel N. Baxter, Wm. Clarke Mason, Clement Mesavage, Benjamin Rush, Dr. R. H. True; *Pike*—Hon. Gifford Pinchot; *Schuylkill*—Samuel L. Kurtz; *Somerset*—V. M. Bearer, A. A. Dupre; *Susquehanna*—Dr. Frederic Brush; *Union*—David Libby; *Warren*—Warren W. Beaty; *Westmoreland*—F. M. Sloan; *York*—Carey E. Etnier, Edgar P. Kable, C. N. Myers.

Association Branches

Following the election of officers, a general discussion arose as to the various methods the Association might pursue in arousing greater interest in forestry in the region. It was brought out that local branches of The Pennsylvania Forestry Association are being set up in some communities in the coal region and that President Thomas hopes that this practice will continue until every community in the area has its branch of the Association.

Mr. Nicholas Yazwinsky, Inspector of the Freeland Division, told of the work the Freeland branch of The Pennsylvania Forestry Association plans to do this spring. These men have been successful in getting the consent of the Jeddo Highland Coal Company to furnish land on which a school forest is to be established by the children of the Hazle Township Schools. Each child is to contribute five cents toward the purchase of trees and the children are to plant the trees. This project will have a sign on it which will read, "Supervised by the Members of the Freeland Branch of The Pennsylvania Forestry Association."

Stanley Mesavage then spoke on the possibility of getting the consent of the supervisors of schools to establish school forests not only in the Borough of Wilkes-Barre but in the surrounding townships.

Clement Mesavage objected to the wording of Point 7 in the Program of the Association as it appears in *FOREST LEAVES*. After discussion, the

motion was made, seconded and passed that the words, "For lumber" be struck out and that the item read, "The planting of trees and other useful vegetation on waste and idle lands and the continued distribution of seedlings by the State."

It was the sense of the meeting that the Association urge the Department of Forests and Waters to purchase the Kitchen Creek Area in Sullivan County and to develop it for forestry and recreation. The Wilkes-Barre Chamber of Commerce, it was stated, is interested in this purchase and will back any movement started by the Association.

A motion was made, seconded and passed that President Thomas appoint a committee to confer with the proper authorities in regard to changing the code as it effects the personnel of the Department of Forests and Waters in such a way that it will protect the tenure of the technically trained foresters and other employees of the Department. It was, also, brought out at the meeting that in certain areas a good percentage of fires have been attributed to resentment due to changes in the fire fighting organization in the district. Changes due to political turnover definitely hamper fire fighting work because the success of a fire crew depends upon organization and wholehearted cooperation of the members.

The meeting was adjourned at 3:45 P. M.

The Banquet

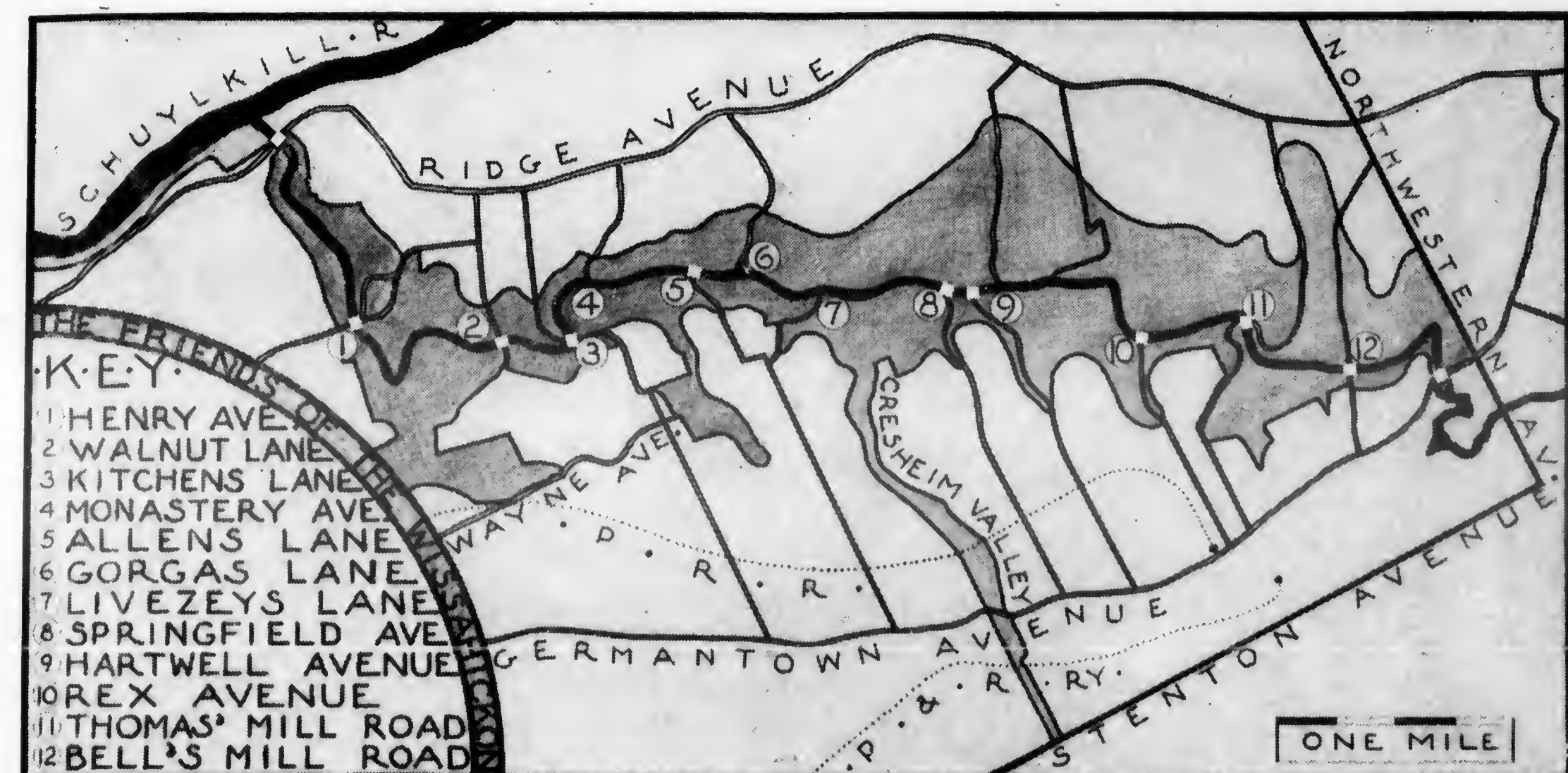
The Dinner Meeting of the Association was held at seven o'clock, in the Ballroom of the Hotel Sterling, with seventy-six present. After a most enjoyable dinner, Secretary Mattoon in the absence of President Thomas introduced Honorable E. Foster Heller who acted as toastmaster. Due to the storm, Secretary Stewart found it impossible to be present, but, fortunately, H. B. Rowland, Assistant Chief Forest Fire Warden, spoke in place of Mr. Stewart. His talk was most interesting and well received. The subject of his talk was:

The State's Responsibility During the Forest Fire Season

"You all realize that the Department of Forests and Waters during the last twenty years has endeavored to protect the forests in the anthracite region from fire. Mr. Wirt has shown us that one-third to one-half of the fires in the State occurred in this region. This is as discouraging to the Department as it is to the people in these counties.

"The Department of Forests and Waters can not carry on the job of preventing forest fires

(Continued on Page 13)



Our Wissahickon Valley

By MRS. FRANK MILES DAY

(Continued from Previous Issue)

The Friends of the Wissahickon Start

In 1925 a small group of people, largely land-owners along the edge of the Valley, gathered at the house of Samuel F. Houston to consider what could be done. That meeting was the beginning of "The Friends of the Wissahickon" now with a membership of over 500. They took as their principle of action: "To preserve the natural beauty and wildness of the Valley and to stimulate Public interest therein." Charles Francis Jenkins was the first President, and in 1933, Francis R. Strawbridge took his place. The principal work of the organization was to give financial assistance in planting out the trees already growing in the Park Nurseries. They also gave a great many young hemlocks to replace those fallen and dying so as to keep up the natural growth of the forest. Every few years thousands of young seedling hemlocks, beech, oak, maples and dogwood have been given to the Nurseries. The policy has always been to plant native trees, emphasizing the hemlocks as the greatest asset of the forest. Of course, the planting has always been under the supervision of Samuel N. Baxter, of the Landscape Department of the Park Commission. By 1930 over 14,000 trees had been set out in the Valley and along its borders.

During the first years of the Depression, through the generosity of the members of the Friends of the Wissahickon, 100 men were kept constantly employed in the Valley. Fallen trees were made into logwood for Park use and for sale. Old paths were improved and new ones made—gutters and drains built and pruning and cultivating done in the nurseries and among the many young trees planted in former years. Nine thousand trees were transplanted to new positions from the bed of Henry Avenue leading to the new bridge while a new nursery was started at Shawmont of seedling trees.

After the unemployment problem was taken up by Federal Funds, our work changed somewhat. Many projects suggested and approved by our Association have been carried out by W.P.A. labor assisted in many cases by our funds.

Harper Meadow

The great addition to the upper end of the Drive—really the northern entrance to Fairmount Park, was accomplished by our efforts in which our Board member, Senator George Woodward, took a great part. The name "Harper Meadow" was given in loving memory of our member William Warner Harper whose house overlooks the

two hills, Andorra and Sugar Loaf, that form the majestic entrance to the Wissahickon Gorge. The stone and log shelter with its beautiful planting overlooking the meadow and stream has a memorial stone to Mr. Harper and was the special gift of our Association.

At present a scientific survey is being made of the whole Wissahickon Valley from its source in the lovely beech and oak forest near Montgomeryville through Gwynedd, Ambler, the broad Whitmarsh Valley and the Gorge itself, including trees, plants, birds, ferns and soils. This is being done under the supervision of the Botanical Department of the University of Pennsylvania by one of the graduate students and is sponsored by the "Friends." It will be of great use in future planting and serve as a scientific record of the Park.

The covered bridge at Thomas Mill Road, the last one remaining in Philadelphia County, is being rebuilt on its old lines after carefully measured drawings and photographs. It will be done by W.P.A. labor under the management of the Park Engineer, Alan Corson, largely through the funds of our Association.

Valley Green Inn

The last, but not the least important of our efforts, is the renovation and improvement of Valley Green Inn. This charming little Inn, almost buried under towering hemlocks and tulip trees and built on a narrow level space between the drive and the steep rocky slope thick with laurel, rhododendron and fern, was erected before 1850 and has been open ever since as a place of refreshment. Recently the building has been put into good order, comfortable dressing rooms added—the kitchen equipment modernized with electric stoves and refrigeration, and is under competent management so that teas and lunches can be served at any time. Special dinners should be ordered ahead. The service is good and is fitted for club gatherings for lunch or dinner for 50 or thereabouts.

Through the generous interest of one of the Park Commissioners, Samuel Fleisher, the former tap room is refurnished with old American maple chairs and tables and an interesting collection of glass and old farming and kitchen utensils decorates the walls. A more interesting and lovely place to take one's friends for a meal could not be found.

The Birds, Trees and Flowers of the Valley

A description of the Wissahickon would not be complete without special reference to the forest trees and the wild life of the Gorge itself, as the



splendid growth of trees, vines, flowering shrubs, ferns and flowers is what really makes its unequaled charm. The hemlock is the presiding genius among the forest trees, its deep, dark green foliage and straight, tall trunks giving a mysterious grandeur. The maples, tulip poplars, hickory, black gum and walnut, sycamores, red and white oaks are the most prominent of all deciduous trees, but the beeches with their silvery gray bark and gold brown foliage persisting through the winter snows are almost the loveliest things in the Valley. Early in the spring the brown leaves flutter away to make a russet carpet and the tiny curled buds appear and through the woods in many places are seen the white dogwood blossoms and the judas tree or red-bud opening its crimson flowers before the leaves appear. The many little streams flowing through their miniature valleys to the main stream are edged with the unfolding fern fronds, the pink and white blossoms of spring beauty and anemone, dog-tooth violet and blood-root, and if one searches under the leaves the furry hepatica and a very occasional arbutus flower. The latter Spring aristocrat used to be frequently found, especially under the oak trees, but now is hard to discover. The bird-lovers are happiest in the Valley during the Spring migration as many large groups of birds have "stop-over" privileges then. But all the year birds are plentiful. The wood-robin is the most frequent thrush of the Valley but hermits and veeries often sing for us. During the winter those who feed the feathered tribe have many firm friends—cardinals, tufted-tits, chickadees, nut hatches, fox sparrows, downy woodpeckers and many others. Lately an attempt was made to shoot the many fine kingfishers that frequent the rocky shores as enemies of the baby trout with which the stream was stocked, but that was soon stopped.

The four-footed inhabitants of the Valley are, except for the ubiquitous gray squirrel, rather shy. The brown squirrel sometimes appears with

his gray cousin, the wicked little face of the brown and white weasel peers out from behind a stone and a friendly raccoon frequently lives near one's garden. Sometimes a possum is seen so there must be others of the family nearby, and the woodpussy, who would like to be a household pet, comes from the woods to visit the kitchen doors of nearby homes. But "Poe's Elk," a poet's dream in 1844, has never been seen in recent years and the deer that were around for a dozen years or more were "planted." It was lovely to meet the beautiful creatures on the edge of the woods or along the trails but they had to be transplanted when they became too friendly with the neighbors' truck patches.

Paths for Riders and Walkers

The twelve miles of bridle paths recently laid out on the wooded slopes make easy walking or riding for lovers of the Valley and are great opportunities for discovering birds and flowers. The edges of these bridle paths are planted with many thrifty young hemlocks, once but tiny seedlings put in the Park Nurseries by the "Friends of the Wissahickon."

But the Wissahickon is not only enjoyed by the solitary pedestrian in search of flowers and birds or the occasional rider. On sunny Saturdays and Sundays, it is alive with groups of children and young people who come down the numerous lanes from Roxborough or Germantown, and with many horseback riders trotting gaily along the Drive. When snow is sufficiently deep, sleighs and bobsleds appear and skiing is quite the thing. The Valley is a wonderful recreational outlet for the energy of the youth of the neighborhood.

Among the many good things done by the W.P.A. workers in these recent times are the sturdy log benches; over 300 of them are placed at intervals along the paths to invite strollers to linger and enjoy the beauty of the rocks, the overhanging trees and their reflections in the water, the unfolding of spring, the gorgeous coloring of autumn or the cold glory of a sunny winter day in a mountain gorge that can hardly be matched anywhere along the Atlantic seacoast or in the Allegheny highlands.

Hail is a result of boisterous weather conditions. Raindrops are carried up by rising cloud masses to freezing altitudes; here they are blown out of the ascending air column and fall to the ground. Frequently this process is repeated several times.

The Task for a Central Seed Laboratory

(Continued from Page 3)

Washington even when planted in that same locality. In Europe, where this problem has been more intensively studied, wide extremes in growth form within a single species have been discovered. For instance, black alder from East Prussia develops into a tree 60 to 80 feet high and valuable for many technical purposes, while the same species from seed collected in Belgium may produce only a shrub some fifteen feet high. Similarly, Scotch pine of good race produces a fine tree of high economic value, while seed from the same species taken out of its natural range often produces weak, crooked trees practically worthless except for fuelwood. One of the important tasks of forest seed laboratories in Europe is to help make sure that the proper source of seed is used in the different localities.

The testing of seed to determine genuineness, purity, and germination is a necessary procedure before nursery or field sowing in order that the seedlings may be of the desired density in the seedbed. If sown too thin, valuable space in the nursery is wasted, and if too thick, seed is wasted when the plants are thinned out.

Finally, certification of forest seed is a task of major importance. Seed should be certified not only as to genuineness, purity and germination but also as to year and place of origin. All forest seed is now required by law to be certified in several countries in Europe. Had America also an adequate certification service, our own foresters would be assured of avoiding the costly mistakes made by early European foresters, and Europeans would have greater confidence in American forest seed, which might cause our exports to increase many-fold. Our Douglas fir, Sitka spruce and white pine are highly prized, provided races adapted to European growing conditions can be obtained with surety.

The large tasks of a forest seed laboratory are two: 1. Well-planned research on collecting, extracting, storing, pre-germination treatment, germination and racial characteristics for the important tree and shrub species of North America. 2. Routine testing and certification of origin, genuineness, purity and germination of seeds for domestic planting and for export.

The American Bison Society, founded in 1905, is considering a memorial to the bison in the heart of the old buffalo country in Nebraska.

What About the Schuylkill River?

(Continued from Page 2)

ed this allocation. The plea of this Association for a conference to be called by the Governor to canvass the situation and explore means of raising the \$125,000, which would insure the completion of \$1,250,000 worth of work remaining to be done, remains unanswered. Apparently the Governor is wholly unsympathetic to the restoration of the Schuylkill. The beneficial result of this work is to be seen from the accompanying picture of a typical project.

In September last the writer, together with Mr. Joseph W. Lippincott and Mr. Joseph O'Byrne, accompanied the U. S. District Engineer in an inspection tour of the upper regions of the Schuylkill where part of the WPA work had been done. We were impressed not only with the protective construction that had been done but also by the way in which Mother Nature was doing its part in preventing erosion of the unsightly culm banks. The accompanying illustrations show how vegetation, trees, shrubs, bushes and grasses were doing their part, not only to protect against erosion but to cover with beauty the ugly scars of Man. We saw at once the importance of promoting such growth and appointed a committee on "Reforestation of culm banks" to press the matter. This committee, of which Mr. Carl P. Birkinbine is Chairman, has been exceedingly active and has accomplished so far the following results. Conferences were had with the U. S. Forest Service, State Forestry Department and the Allegheny Experiment Station looking to an expeditious survey of the situation. It is hoped that within six months to ascertain what kinds of vegetation will grow best and most rapidly, what conditions will favor growth and in what manner production can best be stimulated. Congressman Walter has requested to have an item to cover the cost of these experiments included in the Congressional Appropriation Bill now pending.

When new culm pollution has been effectively stopped, we are ready for step two of the plan which is to arrest down stream movement of the coal now in the headwaters by an intercepting basin made by the construction of a dam across the main river at Auburn and a new channel built, by-passing the basin. This would provide a storage capacity of about two million cubic yards, sufficient to intercept and hold for future recovery, down stream movements of coal waste

from uncontrolled sources in the headwaters, estimated at 300,000 cubic yards annually, gradually diminishing to a negligible quantity in twenty-five years. The estimated cost of this improvement is \$1,738,000.

The plan developed for cleaning the main river channel between Auburn and Fairmount Dam in Philadelphia, in which there is an estimated accumulation of 24,000,000 cubic yards of coal waste, provides for removing by dredging, approximately 15,000,000 cubic yards for which spoil disposal areas are available along the river above Norristown, storing the material in such manner that it can be reclaimed in the future for fuel.

Concerning the 8,000,000 cubic yards now in the channel below Norristown and 1,000,000 cubic yards above, the plan contemplates letting this material move down stream by normal river action for eventual removal by the Government from the tidal section in the course of the maintenance, dredging of the navigation channels. This method seems to have been recommended because of the absence of areas below Norristown



Typical outlet of coal slush water. Many similar outlets pour about 650,000 tons into the Schuylkill each year.

on which the dredgings could be deposited. The method recommended will take longer than dredging unless the movement be accelerated by opening sluiceways in the Fairmount Dam.

The cost of doing this work is as follows: prevent erosion of old mine dumps, about 2½ million; intercepting and desilting dam removing the waste therefrom, about 1¾ millions; removing waste from channel above Norristown, about 6 million; or a total of about 10 million, of which 2½ million has already been provided, leaving but 7½ million as the cost of cleaning up the river.

This in general is the plan. What will you do about it? We have spent more for less worthy projects. Each of the communities of the three million people inhabiting this valley has a special interest to be gained, viz., improved water supply, health and recreation.

How keenly do we want a clean Schuylkill? If we want it badly enough, we can get it. How? By organization. Public opinion, unorganized is of little avail, but when it is organized it becomes irresistible. With this in mind the Schuylkill River Valley Restoration Association was formed. It is composed of individuals, civic, improvement, business and sportsmen organizations, as well as chambers of commerce, public and private corporations, in each of the six counties composing the Schuylkill Basin. Its influence will be in proportion to its members. We invite all to join. "Be a friend of the Schuylkill." Give us 10,000 members and we will give you back a clean, healthy, beautiful Schuylkill. If you will send your name to the Schuylkill River Valley Association, 1023 Bailey Building, Philadelphia, membership applications will be sent to you.

Planning associations have suggested the beautification of the banks of the Schuylkill by extending a parkway, as it were, along each side of the river from Fairmount Park to Valley Forge, and far-seeing citizens believe it well to extend the project up the river far beyond Valley Forge. The writer is in full agreement with all who endorse such a plan but suggests that the first step towards the realization of such a project is to clean up the river itself. A sewer in a parkway setting would not only be incongruous but a menace to the health and comfort of those whom such an improvement is designed to benefit.

The musk deer, source of musk in perfume, has no antlers but is armed with a pair of sharp tusks.

The Annual Meeting at Wilkes-Barre

(Continued from Page 8)

if it does not have the backing of the people. The large land owners have unfortunately been principally interested in what is under the ground and have neglected the things on the surface of the ground with the result that little or no protection is given by the land owners to their surface lands. Progress has been made but has been due almost entirely to the loyal fire wardens and crew members. Years ago fires burned for days or weeks in the hard coal region. Today, they are limited to a few hours due to the energy and the resourcefulness of the fire fighting crew.

"The Department is grateful and is inspired by the fact that The Pennsylvania Forestry Association has seen the need to carry on a forest fire prevention campaign. The active support of all organizations is invited. The Department is, also, grateful that the Allegheny Forest Experiment Station is undertaking a forest economics study in the region and Mr. Forbes may rest assured that he has our full support. I believe if we get together with the various organizations, within the next five years we will be able to increase our forest resources not only in the coal region but in the surrounding area and then we will feel that we are getting somewhere with our forestry program."

Of special interest to the people in the anthracite region is the forest economics study now being carried on by the Allegheny Forest Experiment Station. For this reason, Judge Heller next called upon R. D. Forbes to outline the scope of the proposed study and its value to the region. The title of Mr. Forbes' paper was:

The Anthracite Region Economic Study

"The survey of forest employment possibilities in the anthracite coal region, in which the Allegheny Forest Experiment Station is now engaged, is the direct result of the activities of the Wyoming Valley Chamber of Commerce. Committees of the chamber, headed by Colonel T. H. Atherton and Stanley Mesavage, had been at work on forestry enterprises for several years. Needing help from the Allegheny Station, and finding that the Station had no funds for investigating the problems of the hard-coal region, the Chamber in 1939 enlisted the help of Congressman J. Harold Flannery and Senator Joseph F. Guffey. By hard work these gentlemen persuaded the last Congress to appropriate \$18,-

000 for a study of how far the forests of this region might contribute toward alleviating the present serious unemployment with which we are all painfully familiar, and might be made the basis for permanent forest industries here.

"I should like to report briefly tonight on the progress so far made in the anthracite survey, and to outline future plans. Let me stress at the beginning that we regard our job as a cooperative undertaking, in which we have from the beginning sought the help of all agencies interested in the coal-producing counties and those surrounding counties which with them make up an economic unit. Although our job is one of investigation, we will feel that we have failed unless our investigations lead to action. We cannot expect action of administrative agencies such as the State departments and local governments, unless in the planning and execution of the survey we have had their advice and support.

"We have first tackled the problem of how many men might be effectively employed in an intensification of the protection of forest lands against fire which is furnished by the State of Pennsylvania, with some financial help from the Federal government. Despite State expenditure of above 60 per cent of available fire protection funds in the anthracite region, which includes less than 20 per cent of Penn's forests, the region remains one of the two most heavily-burned in the entire northeastern United States. Great progress has been made in cutting down the size of the average fire in recent years, and we understand that the Department of Forests and Waters is planning this year a vigorous drive on the ever-increasing number of fires. Nevertheless, many extensive forest areas still remain relatively inaccessible to fire-fighting crews, special fire hazards need to be reduced, and physical improvements of various kinds are necessary for prompt and effective handling of fires. The Station borrowed Mr. Edward Ritter, a specialist in fire work, from the administrative branch of the U. S. Forest Service, to determine how many man-days of labor might be absorbed in providing the needed facilities. Mr. Ritter has just reported to Secretary Stewart that in the Wyoming Valley alone 109,000 man-days of work are needed on 32 specific projects. These projects are very largely those which the local district foresters have recommended for construction, but which the State has lacked regular funds to undertake. The 109,000 man-days is the equivalent of the labor supplied by four CCC Camps for more than a year.

"Secretary Stewart endorsed these recommenda-

tions, and has promised his Department's full aid in engineering and similar features of the actual work. He states, however, that because nearly all of these physical improvements will be made on private land—State Forests being nearly absent from the hard coal region—sponsorship for them as WPA or similar projects will have to come from the counties, townships, or boroughs, not from the Commonwealth. Again working in close collaboration with the local foresters, we propose to outline a few of these projects in detail, and to interest the local authorities in sponsoring them. If, as we feel confident, emergency funds are thereby made available, precedents will have been established for a program of similar work throughout the region. No one who heard Mr. Wirt speak today on protection of the anthracite region's forest against fire will doubt the benefits to be derived from such a program.

"A second field of forest employment which we are now exploring is the beautification, by tree planting, of areas disfigured by mining activities and by human abuse. Unless you came to Wilkes-Barre under cover of darkness, you are all aware of the ghastly ruin which men have made of portions of this beautiful valley. Strip mining, dumping of mine waste, and similar industrial processes have made eyesores of considerable areas within some of the most populous communities of the hard coal region. Children's fires in grass and brush, dumping of rubbish in plain sight of travelled roads, and erosion resulting from human use, have intensified the desolation of even larger areas. We do not feel that anyone as yet has the technical knowledge necessary to successful large-scale planting of culm and rock banks, or of strip-pings. But we are satisfied that many of the less-abused areas, and perhaps some of these, can be artificially forested. We are now lining up a few sample areas for beautification. We are investigating the attitude of the owners—mostly coal companies—toward dedication of them to public use. We are making technical plans for planting them. As a final step we will encourage and assist the local authorities, the burgesses for example, in preparing WPA, NYA, or similar emergency projects for turning ugliness into beauty.

"A third objective toward which we are pushing at this time is community forests, created out of areas now in public ownership. We have concrete evidence that a considerable acreage of idle land is now in the hands of the county commissioners, and that the county is receiving no



This poster by Richard Krecker of the Pottsville High School was a district winner.

benefit from its ownership. We are rapidly locating these idle tracts on the ground, and confirming their status. The next step, where title is proven to be in the county, will be to examine the tracts, prepare, for a few typical ones, plans for public management, and assist in putting these plans into effect. Some of the tracts may be close enough to communities to be useful as parks; more remote ones, as wood-producing forests, hunting or other recreation grounds, and watersheds. Almost certainly, emergency labor may usefully be employed in making them a community asset.

"Incidental to the above jobs now under way, we are preparing from aerial photographs and other sources a detailed forest map of the anthracite region. We are compiling an ownership map for at least one county.

"Additional immediate objectives are an estimate of the amount of labor which might be absorbed in planting to commercial tree species of a portion of the land exclusively in grey birch, scrub oak, or other non-commercial species; an estimate of the labor involved in improving natural conditions for wildlife, including not only game animals and birds, but

fur-bearers and species of interest merely because they have been a part of the great natural complex which our climate and our natural environment have produced through the centuries; an estimate of the labor needed to bring the few remaining areas of good forest into productivity comparable with the forests of the Old World.

But beyond these immediate objectives, which deal largely with emergency labor used in rebuilding the now depleted forests, the survey intends to appraise the opportunities for employment in permanent forest industries. We will attempt to estimate the long-term needs of the anthracite mines for props, cross-ties, car material, and other forms of wood, and the number of men who may be needed in harvesting and processing this wood. In addition, we will calculate, in general terms, how many saw-mills, pulp mills, or other wood-using industries may be maintained on raw material from the region's forests, once restored and properly managed for continuous production.

In none of this long-term planning will we overlook the fact that wood is by no means the only product of the forest. We are assured by some of the coal companies that a dense forest cover reduces surface run-off into their mines, and that mine water is among their major problems. We are ourselves confident that forest cover minimizes erosion from steep slopes, and would be of immense value in stabilizing culm and other mine refuse banks.

But overshadowing both wood production and watershed protection is recreational use of forest land. Lying within 125 to 150 miles of upwards of 12,000,000 people, the mountain forests of the anthracite coal region already attract busloads of city people bent on enjoying the autumn colors. Hunters in the fall, fishermen in the spring, use this beautiful country. It is still a privilege to ride up the narrow rocky valley of the Lehigh River, even though it is disfigured by an easily-screened railroad on each bank, and though the timber on its sides is timber no longer, but fire-scourged brush. There are no more inspiring views that those to be had from Mountain Top, or on the main road from Hazleton to Wilkes-Barre. The recreational industry is one which can yield substantial returns *today*, while you are waiting for your forests to grow up, and in constantly greater measure as forest restoration proceeds. We suspect that a substantial forest industry, capable of absorbing significant numbers of those now unemployed, is an immediate possibility in the anthracite coal region.

Longevity of Black Cherry in Pennsylvania

A. F. HOUGH

Allegheny Forest Experiment Station¹

Records of the age of trees, whether from historical sources or determined by annual ring counts, are always fascinating. Moreover, the longevity and mature size of various tree species are often of real moment to the forest manager.

Some recent studies by the Allegheny Forest Experiment Station in the East Tionesta virgin forest of northwestern Pennsylvania have shown that black cherry, *Prunus serotina* Ehr., generally considered a short-lived tree, may reach a maximum age of over 250 years. This is greatly in excess of the maximum ages of 57 and 85 years given by Morey, '36, p. 255, for black cherry at Hearts Content, Pennsylvania, and the Southern Appalachians, respectively.

Examples of large black cherry were known to exist in this East Tionesta tract² in 1930 and a maximum diameter of 38 inches d.b.h. was then recorded. Careful age analysis on ten acres of sample plots in 1934 indicated that a black cherry of 40.0 inches d.b.h. and 129 feet in height had attained the remarkable age of approximately 258 years. Decay had damaged the heartwood at the base of the stem but a sound section, cut 13 feet above ground, gave an age count of 244 years. The 14 year correction for the number of years required to reach 13 feet in height is based on the average growth rate for 42 sapling black cherry located near this veteran.



1. Maintained at Philadelphia, Pa., in cooperation with the University of Pennsylvania.
2. This is called the Wetmore, Pa., tract by Morey. Morey, H. F., 1936. Age-size relationships of Hearts Content. Ecology, Vol. 17, No. 2, pp. 251-257.

Michigan, which is so overstocked with deer that thousands die each winter, has offered hundreds of these animals to Virginia, which has an abundant food supply for deer.

The muskrat is the leading fur bearer in the United States. More muskrat pelts are taken annually than all the other fur bearers combined.

Sixteen

Records show that 726 men and women competed in Pennsylvania archery tournaments last year. Of this number 556 were men and 170 women. Of the total 573 were Pennsylvania residents; the remaining 153 coming from Washington, D. C., Maryland, Delaware, New Jersey, New York, Ohio, Connecticut, Minnesota and Illinois.

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1.
The adequate protection of all Pennsylvania forests from Fire, Fungi, and Insects.
2.
The personnel of the Department of Forests and Waters to be chosen and retained on a basis of efficient service only, in order to guarantee permanency of policy and continuity of action.
3.
The management of the State forests so that they may supply the permanent needs of the people not only for continuous timber protection but also for recreation, hunting and fishing.
4.
Greater co-operation between the departments of the State Government for protection of the beauty of the public lands.
5.
Adequate biennial appropriations for the purchase, protection, and development of the State forests.
6.
The education of the public, corporations, sportsmen, and forest land owners with respect to the value of our forests and the necessity for their development and proper utilization.
7.
The planting of trees and other useful vegetation on waste and idle lands and the continued distribution of seedlings by the State.
8.
The education of our children in forestry in both public and private schools. A love and appreciation of the forests tend to a better type of citizenship.
9.
The establishment of town and county forests which will bring pure air, pure water, and recreation close to the centers of population.
10.
The preservation of the few remaining areas of virgin timber in Pennsylvania.

THE PENNSYLVANIA FORESTRY ASSOCIATION

Organized in 1886

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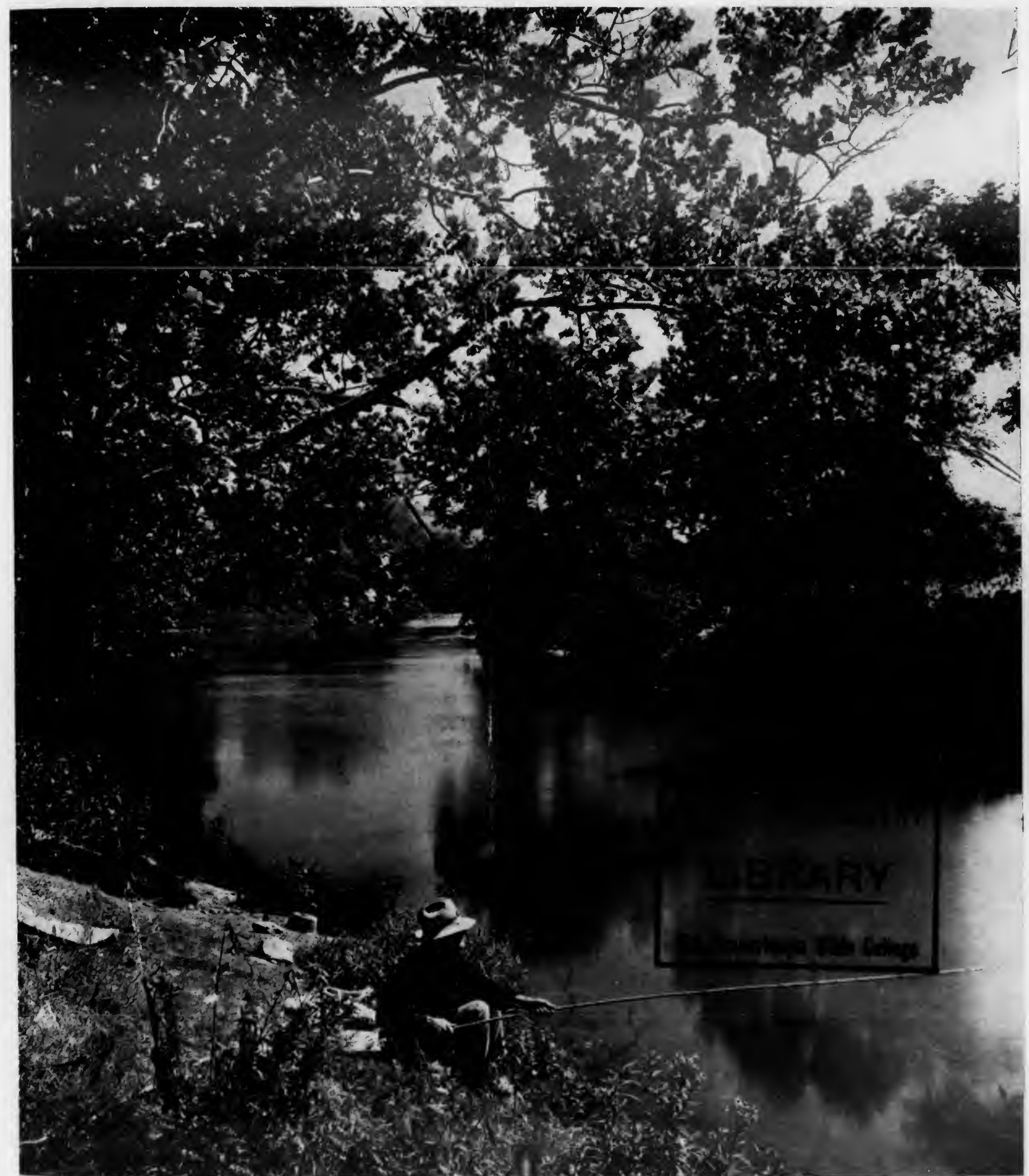
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copy 1

FOREST LEAVES



THE PENNSYLVANIA FORESTRY ASSOCIATION

MAY-JUNE

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THE PENNSYLVANIA FORESTRY ASSOCIATION

Founded in June, 1886

Labors to disseminate information in regard to the necessity and methods of forest culture and preservation, and to secure the enactment and enforcement of proper forest protective laws, both State and National.

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One Dollar of which is for subscription to FOREST LEAVES

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Pennsylvania Markets for Wood Products

By H. GLEASON MATTOON

A RECENT bulletin entitled, "Forest Products Statistics of the Northeastern States," published by the United States Department of Agriculture in February 1940 shows that Pennsylvania brought in from outside of the state about 750,000,000 board feet of lumber and lumber products to be used in building construction and in industry. This means that Pennsylvania is spending out of the state over \$90,000,000 a year for forest products that should be grown and marketed within the state.

The problem of marketing small quantities of timber and other wood products is usually a local one. There are in Pennsylvania many small mills making a variety of materials out of wood that strive to find their wood sources near at hand. If the woodlot owner inquires, he can frequently find a demand within a few miles of his woodland which will take much of the material he has to market. Manufacturers of boxes and crates, brushes, chairs, excelsior, fixtures and molding, furniture, handles, ladders, shuttles, spools and bobbins, toys, vehicles and planing mill products may be found in many part of the state. If the small woodlot owner will make an effort to get in touch with local concerns and will manage his woodland so that a continual supply of wood products is available, he will usually not have to look far afield for a market.

In addition to those mentioned above a new demand has been created in Pennsylvania by the war. Previous to September 1939, felt, such as that used as a linoleum base and for roofing material, was manufactured from rags many of which came from Europe. With the loss of the European supply, it was necessary to turn to other sources for the raw materials from which to make this felt. About a year ago a Swedish manufacturing company marketed in this country

a machine known as a defibrator, the purpose of which is to turn wood into felt.

Logs 3 to 8 inches in diameter and 4 to 5 feet long, with the bark on, may be put into this machine where they are chipped, then cooked in 160 pounds of steam, after which the cooked chips are forced through a small orifice and between two revolving plates which separate and flatten the fibers, whereupon they are ready to be made into felt. At present, the only company in Pennsylvania using this machine is the Certain-Teed Products Corporation of York, Pennsylvania. While it is doubtful if felt will ever be made entirely of wood, it is probable that the percentage of rag will be reduced as further experimentation is carried on. At present 30% of wood is used. Other manufacturers, such as Johns-Manville, Congoleum-Nairn, Inc., The Celotex Corporation, and Flintkote Company, are also using these machines and are continually changing the species of wood used. Some of them prefer soft woods while the Certain-Teed Products Corporation at their York plant is now using principally oak and other hardwoods.



Mine Timber for Susquehanna Colliery Company



A well-stocked stand of oak. Proper management will assure a continuous yield of ties and saw timber for the railroads.

The limitations on material is not as great as those of pulp mills. Wood that is knotty with occasional decayed places, is accepted. There is no objection, also, to old burns. However, one specification must be adhered to which is that the wood shall be delivered green. This, of course, allows cutting to be done at almost any time of the year.

All of the wood now being bought by the Certain-Teed Corporation is trucked in by farmers, other woodlot owners and dealers from an area within fifty miles of York. Their requirements are still small and their yard today will hold but 150 cords, but it is possible that the demand, particularly if the war continues, will increase. The prices paid the woodlot owners are slightly lower than those of pulp mills in the same locality, but with less exacting requirements and because the logs do not have to be peeled many woodlot owners find this an excellent outlet for material taken out of the woodland during selective cutting operations.

Mr. M. W. Ways, Purchasing Agent of the Certain-Teed Products Corporation, is anxious to do business principally with those woodlot owners who are trying to maintain their wood-

land under some form of management so that a continuous supply may be had.

Three of the chief markets for small quantities of wood products in Pennsylvania are pulp mills, railroads, and coal mines. In 1937, 194 pulp mills in Pennsylvania used 354,547 cords of wood. Much of this, of course, came from outside of the state, primarily because the mills could not find a large enough local supply.

The Pulp Wood Market

The specifications given below for the pulp wood market in Pennsylvania are those furnished by the P. H. Glatfelter Paper Company of Spring Grove, Pennsylvania. This company is noted primarily for the large number of species of wood it uses in the manufacture of paper. For book paper, a thick opaque fiber is needed, such as those found in hardwoods, notably the oaks; while writing and bond papers are made from straight long fibers of the soft woods, particularly the pines and spruce. In 1940, the following species of wood will be used by this paper company: Beech, birch, maple, poplar, ash, elm, sycamore, basswood, oak and pine. It is seen from this list that almost any species of timber

(Continued on Page 11)

Management of Sprout Oak Stands

By ROBERT W. STADDEN

THE second-growth oak forests of the eastern and central United States are largely of sprout origin, and the proportion of sprout trees is generally increasing. Forest products worth millions of dollars are produced annually from these stands. Under proper management and adequate fire protection these sprout-oak forests will become a more important source of forest products than at present. They are usually well-stocked, make very good early growth, and are particularly suited for the production of cross ties, posts, mine props, and other products that do not require a long rotation.

Sprout growth has both desirable and undesirable features. Abundant regeneration and rapid early growth, which are characteristic of sprout stands during early age, give a distinct advantage in short rotations, but frequent occurrence of butt rot often makes sprouts less desirable than seedlings on long rotations used for the production of high-quality lumber.

Unfortunately, all too often the loss from butt rot is unpredictable in the growing stand and its extent is learned only at the time of cutting. Wounds caused by fires in hardwoods have been studied as avenues of entrance for heartwood-destroying fungi, but the infection of sprouts from the stump from which they originate or from dead or cut companion sprouts has not been carefully investigated.

Recently Dr. Elmer R. Roth, Junior Pathologist, and Dr. Bailey Sleeth, Assistant Pathologist of the Division of Forest Pathology, Bureau of Plant Industry, completed an investigation to determine what factors other than fire wounds are of importance in causing decay in sprout oak stands. Its primary purposes were to obtain information on (1) the manner in which butt rotting fungi gain entrance into sprouts free of fire damage, (2) the danger of decay spreading from cut or dead sprouts, (3) the percentage of trees infected and the extent of decay, (4) the factors contributing to the spread of decay, (5) which species of oaks are most susceptible to butt-rotting fungi, and (6) practices that would reduce decay losses.

Origin and Development of Sprout Stands

Sprouts generally originate in the region of the root collar in most hardwoods. Eventually some of these sprouts become mature trees.

Sprouting usually takes place within the year following cutting. Shortly after cutting, wood destroying fungi attack the stump and gradually cause its decay.

The rate of growth of the fungus in the stump depends upon several conditions. A small, low, smoothly cut stump with one or more vigorously growing sprouts is soon calloused over and the fungi die out. On the other hand, large stumps will continue to decay for several years. After a stump bearing a sprout has disappeared as a result of decay or has become covered with new wood, the sprout may easily be mistaken for a seedling. This obliterating of the parent stump makes it difficult to distinguish between seedlings and sprouts from small stumps after the trees reach a diameter at breast height of 5 to 6 inches.

Age, Size and Vigor of Stump in Relation To Sprouting

The sprouting of capacity of stumps has been found to depend upon their age, size, vigor and the species. Usually, the older and larger the stump the poorer its sprouting capacity. Oak stumps larger than 24 inches in diameter or older than 100 years usually do not sprout although there are records which show that red oak stumps over 200 years old have grown sprouts. White oak stumps lose their sprouting capacity the earliest of all oak species and red oak the latest. To secure the best growth in copice stands it has been the practice to select only small low cut stumps 6 inches or under in diameter for reproduction purposes. The stocking of the mature second growth stand is much more dependent on the number of stumps sprouting than on the original number of sprouts.

From this study it was evident that the parent stump is a more important avenue of entrance for butt rot than it has been considered in the past. In general, sprouts from high stumps are more subject to butt rot than those from low stumps.

It will take longer for high large stumps to decay than for small ones. Consequently, the decay in the larger stumps will remain active longer and will present a hazard to the sprouts over a greater number of years. This may account for the greater percentage of decay cases in sprouts originating from high and large stumps.

(Continued on Page 8)

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MAY-JUNE, 1940

MORE ELM DISEASE

A CASE of Dutch elm disease has been verified on the grounds of the Philadelphia State Hospital, commonly known as Byberry, Roosevelt Boulevard, Philadelphia. The tree was taken down late in April and burned.

This adds another county to the number in Pennsylvania which have been invaded by this foreign disease. Presumably, this tree was attacked last summer, and it is likely that beetles may have left this tree last fall to go to other elms nearby. If this is so, the disease may now be in other trees on that or adjoining properties.

Early in June scouting will again be started, but with the continual increase in the area of infection, and decrease in available funds it will not be possible to scout the area adequately. A deficiency appropriation seems imperative if the work is not to be curtailed.

If Pennsylvanians cherish their elms it may be necessary to insist that the Pennsylvania legislature appropriate funds.

H. G. M.

Four

THE MARKET FOR WOOD PRODUCTS

ELSEWHERE in this issue will be found the first of several articles on the Pennsylvania market for wood products. It is hoped eventually to assemble more or less complete information concerning the demand of the wood-using industries of the state.

Not only will this be of inestimable value to the woodland owners, but such information will also be needed in the preparedness program now getting under way in the United States. Notwithstanding the enormous quantities of steel and other materials now necessary in equipping mechanized units in modern warfare, wood is still essential for parts of the army's equipment.

In war or peace thousands of Pennsylvanians depend upon lumber and its remanufacture for employment. Much of the lumber now used in Pennsylvania manufacturing plants comes from without the State. According to a recent bulletin of the United States Department of Agriculture, in 1936 only 16% of the lumber used in Pennsylvania came from the forests of the State. While some of the woods needed in these manufacturing operations can not be grown here, they do not account for 84% of the lumber which is brought in from elsewhere.

There is need for a comprehensive survey of the requirements of the wood-using industries, over 1200 of which are listed in the Ninth Industrial Directory of the Pennsylvania Department of Internal Affairs, published in 1938.

Some means should be found to make it easier for the timber owners to find nearby markets for their products. There is little use in urging reforestation or improved management so long as the woodland owner has no information on the markets for wood products.

We in America have always excelled in growing crops and in efficient manufacture, but we have given too little attention to one link in the chain of better living and that is distribution. After all, that is the problem that confronts the woodland owner today, proper distribution of the products he grows. The Pennsylvania Forestry Association in undertaking such a task will be rendering a distinct service to Pennsylvania forestry.

H. G. M.

FOREST LEAVES

Wood Utilization on the Farm

By ASHTON ROLLINS

IN running a thousand-acre farm in Dover, New Hampshire, I have the double problem of making my woods carry their share of the property and still develop them for high quality products. I can and do cut some good timber both for my own use and for sale, but it is disposing of my low quality timber that presents the greatest problem. Over a period of years I have been working out ways of utilizing by-products which ordinarily are considered as having no value. Although primarily interested in providing low cost materials for repairs and construction I am also interested in the future forest, and the removal of my low quality pine now will leave a much better stand in the future. The farm is located in good pine country; the growth is good but a large percentage of the trees are young, knotty and crooked. It would not be practical to cut most of them into square edged lumber and they are of little value as firewood.

Long ago, on account of unreasonable taxes, I decided that if I were going to be able to keep my trees to hand down to my children I would have to get something from them. I invested in a sawmill and shingle mill to help accomplish this end. Today it is a close race and I may have to make a clean cutting of some of my stands, but to date I have been fortunately situated to use these by-products. I have been able to sell them to myself. I could have disposed of very little to the buying public.

To begin with, Three Rivers Farm has 13 barns, 8 dwellings and 11 large sheds, garages, etc., to keep in repair. Three of these are built of brick. Since 1920 a good 85% of the repairs for these buildings have been by-products from my woods. I consider everything a by-product, except trees, that will make sound square edged pine lumber. By-products built two of these buildings completely and fences for 125 head of cattle. The slash supplied six families with stove wood. I do not use steel fence posts but use treated pine stakes cut from my own woods. Two feet of these are peeled and the ends sharpened on a power saw and thoroughly dried. This is done as odd jobs during stormy weather. When dry the posts are put into a large steel drum containing creosote. After 24 hours they are placed in an empty drum to drain. If the right

kind of creosote is bought it is not necessary to heat it if the posts are dry. This special creosote is delivered here at 40 cents a gallon. We are using these posts in competition with steel ones. Properly treated the pine ones are more satisfactory. They drive as easily as steel, are stiffer, and hold up the fence better. Also, it is easier to fasten wire to a wood post than a steel one. The board and rail fences outlast wire and are safer than barbed wire for our cattle, eliminating the lightning hazard. The pine cost us about 10 cents apiece on the job whereas steel or cedar ones cost 25 cents and up. Larger poles are made into set stakes and gate posts in the same way. Those that are straight are slabbled on two sides. The poorest of these are used for rail fences, the best for purlines and floor timbers.

All of our buildings are framed in the old fashioned way, all new ones are built that way also. It is not necessary, therefore, to cut a valuable tree to get rafters and floor timbers of 2x6 or 2x8 dimensions. Large trees, both dead and alive, that should be removed are slabbled on four sides. These are used for upright posts, in the old style of framing, sills, carrying sticks, trusses, etc. The waney edged boards from these are used for fence rails. To get square edged boards for floors and siding we cut large trees. Seldom do we have to take a really fine tree of any size except to get plank for water troughs or pine flooring, which should be heart-wood only, to prevent buckling. I believe our pine makes the best of floors even with modern steam heat, if the sapwood is all cut off and the edge of each board is slightly bevelled downward toward the under floor and nailed with cut nails.

We make thick butted old-fashioned pine shingles from any sound trees, choosing pieces 16 to 18 inches between knots. These are laid 5½ inches to the weather and outlast anything except the very high prices composite ones. For siding they are laid wider and last forever.

From all these trees every limb is saved. It is cheaper to chop limbs on a block for kindling than it is to saw larger wood into lengths and split it. In addition, we use our own hardwood and some of our softwood for fuel. Farmers who own hundreds of cords of wood fuel are today

(Continued on Page 13)

MAY - JUNE, 1940

Five



Biography of a Tree

By H. GLEASON MATTOON

IN the autumn of 1529 an industrious chipmunk dropped a beechnut from its overstuffed cheek pouch into the leaf strewn woodland soil that bordered the waters of the Chesapeake. It was a plump and virule nut, an embryo that chance had reprieved from an unworthy gastronomic end.

Nestled in its leafy bed this seed lay hidden from the discerning eyes of other rodents whose winter larders craved more food. Whereupon it became the unconscious duty of a Choptank brave to complete the planting process, when, in stalking game, his moccasined heel firmly pressed this favored nut deep into the forest soil, there to be protected throughout the frosty months ahead.

The warmth of returning spring found the embryo full ready to break its prison pericarp, first with radicle thrust deep into the breast of earth therewith to be nurtured by her nutrient salts. Next came the cotyledons pushing upward through the duff, seeking the vitilizing forces of atmosphere and light. And so this nut became a tree which thrived and grew in friendly competition with surrounding flora. Sturdily it grew and straight, unbent by nature's storms, unharmed by beast or man, until it held its head high above its vegetating neighbors.

Though of the forest, this gray frocked thing seemed to stand apart, serenely unaware of life's eternal struggle for existence. Within the periphery of its extended arms it witnessed new life and death—the young squirrel's first contact with light, the fledgling's venture from its nest, an Indian chief's last journey, his resting place marked by mound of soil and oyster shells. Time passed and this noble tree increased in height and girth, while the forest life beneath continued a relentless competition ordained of Nature that not one of Her multitudinous biota might perish except through evolution.

One hundred forty years thus passed with new waves of life following old upon the shores of the Chesapeake without change or variation and within these years the beech became the equal in girth and spread of many a crumbling monarch of the woodland—clean and sound in bole and limb.

Then in the summer of its one hundred forty-first year this noble beech witnessed strange things. A new creature, a pale faced man, disturbed the tranquility of the forest with a noisy weapon that spit fire and murdered beast and bird and Indian alike. Soon other white men came and talked of grants of lands from Charles Calvert, Lord of Baltimore, whereupon the ordered life of the woodland ceased. Trees were cut and burned; strange beasts and implements uprooted

stumps and overturned the forest soil; unfamiliar seed was sown; exotic insects and vegetation threw out of balance Nature's laws.

Next came a man of bearing who, standing within the ample shade of this beech, gave orders that trees should be felled and fashioned into a manor house. Then turning, he gazed upon the sturdy tree and being pleased by its size and perfect symmetry, gave direction that none should harm such a goodly specimen. And so this house was built, ample in proportion, nestling one ell beneath the beech's canopy. With the first leaves of spring came the lord of the manor with his lady to take up his abode in this new land, and with their coming the beech lost many friends.

No longer did the graceful fawn rest within its shade, shielded from the heat of the midday sun. Likewise the fox and 'coon sought security in the denseness of the unspoiled forest lands. Molested by the white man's guns even the birds forsook its welcoming branches for securer nesting places.

Alone this gray monarch stood, the younger flora about it rooted out to make a lawn, whereon exotic trees were placed, European lindens, an English yew, and other foreign things. Deserted it stood and looked down upon a feverish activity that was alien to the casual life ordained by Mother Nature.

Brown-skinned men appeared who did the master's bidding, sowing and harvesting, toiling and singing. Year followed year and still this giant added to its stature. No longer of the forest, it became an integral part of the plantation, a compassionate overseer who witnessed human weaknesses and strength. Pettiness and truth it saw, while filtering through its branches came tales of intrigue, of valor and of war.

Upon its bole it carries visible record of many lover's trysts beneath its boughs, two hearts entwined, that with the increment of girth have blended into one. Other scars of men it carries too, but none detracts from its nobility.

Were interlocation possible, this majestic beech could well recount the cavalcade of life, could judge for us the white man's stream of history within this land. Yet for all its centuries of life it gives no evidence of decline, no hint of the infirmities of age. It will live on, perhaps four hundred years, perhaps a thousand. *We* shall never know.

But from the fortitude, the beauty, serenity and strength here exemplified, we who have, upon this mortal sphere, but an hour in the eternity of time may gain new inspiration to make of that hour something that shall not cease with our passing.

Management of Sprout Oak Stands

(Continued from Page 3)

From these observations it would seem important therefore that in making improvement cuttings, careful consideration should be given to the origin of the trees removed so that those originating from low small stumps may be allowed to remain for timber purposes.

Time and Extent of Heart Wood Formation

Heart wood usually appears in an oak sprout in from 8 to 15 years. Some of the factors that influence the formation of heart wood in a sprout are age, rate of growth, and distance from active cambium. The last seems to be more important than age in developing heart wood. In suppressed sprouts there is a greater percentage of sap wood than in the faster growing trees.

The heart wood extends down the stem until it connects with the heart wood of the parent stump. This heart wood connection usually takes place when the sprout is from 12 to 18 years old. Since decay travels in the heart wood, the time of union of the heart wood of the sprout with the stump influences the spread of the decay from the old stump through the sprout. For instance, in the white oak group the heart wood union occurs later than in the black oak group and this accounts for a higher percentage of decay in the sprouts from species of the black oak group.

Young, rapidly growing trees usually become affected earlier than slower growing sprouts because the heart wood union forms earlier in more vigorous trees. The time of formation of the heart wood union is a definite factor in the spread of decay. In small low parent stumps decay may run its course and the fungus may become inactive before the heart wood union is formed. In such a case the sprout will not be infected. This is another reason for saving such sprouts for timber trees in the management program.

The lowest percentage of butt rot in sprouts was found in chestnut oak, the next lowest in white oak, the red oak next, then scarlet and black oak. The percentage of black oaks with butt rot was nearly four times that of chestnut oak and twice as great as in white oak. This difference in susceptibility to infection between the white oak group and black oak group is partly due to the time factor in heart wood union between sprouts and stumps. The earlier age of

infection may be chiefly responsible for the greater height of decay in black and scarlet oaks.

Decay in Sprout Stands that Arise After Fire

After a severe burn, trees and stumps are capable of producing sprouts if some of the latent buds at or below ground level escape injury. White oak sprouts readily from stumps that have been killed by fire and may continue to sprout during 30 or 40 years of periodic fires but eventually loses its capacity to sprout. The percentage of decay cases in burned plots is much lower than in unburned plots.

Hot fires and repeated burnings usually kill the cambium down to the ground level, thereby destroying latent buds above that point. This forces sprout growth from the buds that occur below ground level. As previously pointed out, the percentage of decay increases with the height of the sprout origin, hence sprouts from below ground level are less apt to contain decay.

Management Practices to Keep Butt Rot at a Minimum

There are two types of stands to be considered in any recommendations dealing with sprouts—(1) very young stands, in which decay can be kept to a minimum by correct treatment throughout the life of the stand; and (2) the older sprout stands, which are already established but in which the total decay can be somewhat reduced by proper cultural treatments. In either case the principal method of attack is to favor in cultural operations the sprouts least likely to be infected.

In working with very young stands (up to 3 inches at breast height and not over 20 years old) the factors affecting decay are more readily recognized, and treatment should be undertaken wherever possible at this young stage. The following recommendations are offered for these stands:

1. Seedlings or seedling sprouts should be favored as crop trees.

2. Sprouts from small stumps (preferably less than 3 or 4 inches and not over 6 inches in diameter at ground level) should be favored over those from larger stumps. After a stand is more than 10 to 15 years old there is difficulty in determining the size of the stump from which the sprout originated without dissecting it.

3. Wherever possible, sprouts originating low on the parent stump (near ground level or below) should be favored over those of higher origin. The height of sprout origin cannot be determined for older stands without dissection.

Sprouts from low-cut stumps should be favored over those from high-cut stumps.

4. In the selection and thinning of fused sprouts, the procedure recommended is to cut flush at the crotch, or as nearly flush as can be done without injury to the favored sprout, so that rapid healing-over may take place. Care should be taken not to loosen the bark at cuts, or healing-over will be retarded. With sprouts less than 1 inch in diameter, flush cutting may be inadvisable because of increased cost.

Recommendations for stands already established (more than 3 inches at breast height and generally over 20 years old) are as follows:

1. Single sprouts are preferable to many sprouts, particularly if the latter require thinning. It was found during the present study that as a rule single-stemmed trees came from smaller stumps than twin trees.

2. Sprouts with the stump wounds not yet grown over or with enlarged butts should be

discriminated against. These sprouts are likely to be from larger stumps and to have higher origins than sprouts with closed or no stump wounds.

3. Clumps of large sprouts that are fused for some distance above ground level, or that have low V-type crotches, should be either entirely cut or left entirely intact and should ordinarily be avoided as crop trees. Sometimes it may be advisable to leave such sprouts as trainers for crop trees.

Recommendations that apply to stands of any age are as follows:

1. For some short-rotation crops, such as cordwood, losses due to decay will ordinarily be of minor importance and no special precautions are necessary. However, in areas used for mine-prop and post production, decay may be more important than is now realized. In general, the longer the expected rotation the more attention should be paid to keeping decay at a minimum.

2. The trees on areas that have been repeatedly cut over are likely to be highly defective and should be avoided for the growing of long-rotation crops. Improvement operations in such stands may be difficult, and the chances of obtaining a sound stand are poorer than in stands that have been less frequently cut. When a young stand is already badly infected from the parent stump, a short-rotation crop is advisable, with later efforts directed at converting the stand to seedling, seedling sprout or better sprout growth. Where infection is not common, emphasis should be on increased care in improvement work.

3. When trees are badly wounded by fire, the butt rot hazard is already high. Precautions taken to reduce stump and stub decay transmission in such stands are less likely to reduce subsequent loss due to butt rot than had the trees been unscarred.

The effectiveness of any treatment will depend on sound judgment and careful work on the part of both supervisors and workers. The recommendations herein presented apply in a general way wherever stand-improvement work is being carried on in sprout oak stands and less directly to sprout growth of some other species.

Lumber production in Pennsylvania in 1899 amounted to 2,333,278,000 board feet. This was produced by 2280 saw mills. Thirty-nine years later in 1938, the lumber production had dropped to 148,104,000 board feet, while the number of mills had decreased until there were but 384 reporting.



Upper photos show early heart-wood union from a high stump; lower photos show type of sucker growth which should be saved in selective cutting.

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The P. H. Glatfelter paper mill at Spring Grove, Pa.



The pulpwood storage yard can handle 20,000 cords.

Pennsylvania Markets for Wood Products

(Continued from Page 2)

tree growing in Pennsylvania with the exception of hickory, black walnut and locust can be turned into paper.

It has been the policy of this company and of its forester, Rex Clauser, to buy wood as far as possible from those woodlot owners who are willing to maintain a management system so that a continuous supply may be cut. Wood is purchased over an area approximately covering the eastern third of Pennsylvania, from the New York State line to Maryland. It is trucked in to the yard at Spring Grove where upward of 20,000 cords may be stored.

The specifications for this year are as follows:

Rates on Wood

DISTANCE	RATE
1-30 miles	\$ 9.50
31-40 miles	9.75
41-50 miles	10.00

Quantity Upcharge

1-100 Cord: Base price \$9.50.
101-200 Cord: Plus 25 cents a cord.
201-500 Cord: Plus 50 cents a cord.

All wood has to be inspected and approved by the P. H. Glatfelter Company. It must be sound, clean timber, 5 ft. in length, all straight and from 4 to 20 inches in diameter at the small end. Logs under 10 inches in diameter should not be split.

Accepted Species

Group No. 1: These may be mixed; all pines except pitch and mountain pine.

Group No. 2: Mixed tulip poplar, aspen, cottonwood and basswood.

Group No. 3: Not mixed, birch, beech, maple, ash, elm, sycamore and oak. All species of each of these trees.

For the farmer who owns the woodlot there is one difficulty in supplying this market. The wood must be cut late in the winter and early spring and the peeling of the wood must be done between the middle of April and the middle of June. This is a time when the farmer has many other things to do in order to prepare his ground and plant the crops, hence it is necessary for him to hire additional help which reduces his net profit. The company has tried out peeling machines and while these machines do a reasonably good job it has been found that peeling at the plant sometimes causes dissatisfaction because the woodlot owner feels that too great a reduc-



Pulpwood cut in selective cutting operations on lands of Armstrong Forest Company, Johnsonburg.

tion in volume is deducted for the peeling operation. Normally, about 12% of the volume of a cord of wood is lost in peeling. It may be that new improvements now appearing will make it possible to do this barking more economically and in a manner that will be satisfactory to the farmer. If this should be the case, it will make it possible for the farmer to cut wood at other times during the year which will be of considerable benefit to him.

While large quantities of oak normally is used by the Glatfelter Company, due to agitation by some of the conservation organizations which claim that the tannic acid in the streams has killed fish, it has been decided this year to use no further oak until changes have been made in the manufacturing process which will increase the evaporation of liquids, thereby reducing the amount of tannic acid released. These changes will cost approximately \$50,000 and it is to the credit of the company that they are to be made notwithstanding the fact that no criticism has been voiced by the Pennsylvania Fish Commission or the Department of Health of the amount of tannic acid which has been released. Between six and seven thousand cords of oak normally are used by the company each year, but this

amount will be materially cut until the new construction is completed.

Each species of wood has to be cooked separately, except the softer hardwoods such as basswood and poplar, which may be put into the cooker together. Sycamore, elm, ash, maple and oak are stored separately in the yard until sufficient quantities of each species have been accumulated to provide a run of the mill.

Inspectors have to be careful to see that no wedges or fence wire is left on the peeled logs since they frequently ruin the chipping machines. A wedge left in the log has occasionally done as much as \$350 worth of damage to the cutting machines. Old burns which have grown over, also, have caused difficulty because charcoal cannot be bleached. Not long ago, one log was run through the mill which had been burned years ago after which the burn healed over so there was no external evidence of the charred condition of the inside of the log. The result was that the entire plant had to be shut down and all pipes and vats had to be cleaned otherwise particles of charcoal would be continually released and would spot paper for several weeks.

Coal Mining Companies as a Market

Many of the coal companies have found it necessary recently to buy their small timber

supplies from large dealers who are moving further away from the collieries for their supply of materials. At one time, for instance, the Lehigh Navigation Coal Company bought all of its small timber from local farmers within fifty miles of the collieries, but with the clear cutting that has been practiced there is now practically no supply near at hand. Rapid sprout reproduction, however, will make it possible for small woodlot owners in the coal areas to meet this demand again, providing they manage their woodlands and protect them from fires.

The following specifications are those of the Lehigh Navigation Coal Company as submitted by A. C. Neumuller, forester of the company. While these may differ somewhat from the specifications of other coal companies they are essentially similar.

1. Hardwood Gangway Timber—100% oak, cut in 9' lengths, small end diameter 10"-15", beveled at one end 3" in 12". No group knots, crooked timber or heavy tapered material accepted.
2. Hardwood Chute Timber—100% oak, cut 5', 6' and 7' lengths, small end diameter 5"-8", beveled on one end 2" in 7". No group knots, crooked timber or heavy tapered material accepted.



Hand hewing of railroad ties.

3. Hardwood Poles—80% oak, 20% other accepted hardwoods such as beech, maple and yellow birch, lengths 6', 9', 11' and 12', small end diameter 3" to 5".
4. Lagging—5' hardwood, no objection to species, sound wood only required, 2½" round small end, 3" split small end diameter.
5. Mine Ties—6' and 7', 6" thick, 6" face—all oak.
6. Mine Boards—1" oak, furnished in 6' and 10' lengths, 6" and up in width; sound, serviceable boards, not over 1" knots, not more than ¼" wane, sawed full to size in the rough.

All timber is delivered by truck to the company collieries, prices varying somewhat from year to year and with the distance the material has to be hauled. This is a market, however, that should interest woodland owners within easy trucking distance of the mines, particularly since there is a year-round market.

The Railroad Market

The railroads of Pennsylvania require quantities of wood for varying uses, such as fence posts, bridge ties, piles, cross ties and for freight cars and locomotives. The Pennsylvania Railroad, for instance, uses approximately two million cross ties a year. These come in several sizes. The present prices f. o. b. any Pennsylvania Railroad station loaded on the car are as follows: for ties sawed or hewed top and bottom only, 6" thick by 6" wide, 55 cents; 6" thick and 7" wide, 70 cents; 6" thick and 8" wide, 88 cents. For ties sawed or hewed, top, bottom and sides, 7" thick and 8" wide, \$1.04; 7" thick and 9" wide, \$1.17. The species acceptable under this classification are black locust, honey locust, red oak, white oak, and back walnut. If the ties are made of beech, birch, cherry, gum, hard maple, catalpa, elm or sycamore, the price for each classification is somewhat lower. Three hundred ties, which is a carload, is the smallest number acceptable in any one order. All cross ties today are treated with preservative which increases their life many times. Untreated ties normally last about eight years while treated ones have a use-span of twenty-five years.

Since the specifications and demands for ties, piles, etc., vary from year to year and among the railroads, it is always wise to make inquiry before undertaking cutting operations. Only oak

and southern pine are accepted by the Pennsylvania Railroad for bridge ties and, of course, they must be free from defects that may impair their strength or durability. Among the forbidden defects are decay, large or numerous holes, knots, shakes, splits, warp or grain with excessive slant. Bridge ties must be sawed on the top, bottom, sides and ends. The dimensions vary with the order.

Railroads are in the market from time to time for fence posts, piling, and hardwood roofing, sheathing and slats for box cars. Step boards for all cars, planks for gondola cars, and flooring for both flat and gondola cars are made only of oak, according to John Foley, forester of the Pennsylvania Railroad.

It is gratifying to know that most of the large wood users prefer to buy their supplies from woodlot owners who strive to manage their woodlands in an intelligent manner. The owner who looks upon his woodlot as a perennial crop to be cut so that it will continually replenish itself is the one who can sell material regularly. In many cases, foresters employed by these companies will assist in developing such a management program.

Wood Utilization on the Farm

(Continued from Page 5)

buying oil and coal because they do not know where to buy an efficient wood-burning furnace and because an efficient wood-burning cook stove has not been designed. This is something that the forestry organizations should spend some time on.

Because of the character of labor used on the farm and the use to which these by-products are put it is impossible to make a profit and loss report on these operations. None of these by-products could have been sold but if a record could be made of all the wire, steel or cedar posts, roofing and imported lumber they have taken the place of the value would be great. All this has taken a lot of thought and work but I have felt it worth while if it enables me to conserve my good trees. They have a scenic value to the town and I think will have a future cash value. I hope taxes won't win the fight.

Reprinted from Forest Notes, a publication of the Society for the Protection of New Hampshire Forests.

A Community Forest In Pennsylvania

Under the Act of 1850, the Borough of Tamaqua acquired in April of that year 17 acres at Rabbit Run for the purpose of establishing its first water supply system. Later an additional 100 acres were added to the holding. Rabbit Run is located west of the Schuylkill River between Sharp and Second Mountains, and has a total watershed area of about 600 acres. In 1882, the Borough Council decided that Rabbit Run could not provide ample water for the anticipated growth of the community and therefore turned its attention to Owl Creek as a supplemental source of water. Owl Creek is located east of the Schuylkill River between Pisgah Mountain and Mauch Chunk Ridge being about four miles long and having a watershed area of 2500 acres. The original purchase in the Owl Creek Valley amounted to 159 acres, which has been increased from time to time until today the Borough owns 1232 acres of this watershed. 750 acres of this were acquired in 1939.

Nearly all of the acreage of both watersheds was covered with a mixed hardwood stand of young second growth material. Plantings were started in 1919 and have continued until a total of 300 acres have been reforested. The species used are Norway Spruce, Banks Pine, White Pine, Scotch Pine, Red Pine and Japanese Larch.

The rest of the evergreens were used as under-plantings in the hardwood stands after improvement cuttings had been completed. Improvement cuttings have been made on 100 acres to date, using WPA labor at a total cost of \$25.00. Present plans call for additional improvement cuttings as money is available. Whenever these are undertaken, under-plantings of conifers will be made so that eventually the character of the entire stand will have been changed.

In addition to improvement cuttings and plantings, the management's policy has included organized fire protection. Approximately four miles of fire lanes have been constructed. Some of these are well surfaced roads over which one may drive. Fire crews have been organized consisting of the employes and have been equipped with fire pumps, rakes and back fire torches. The efficiency of these crews is attested by the fact that there have been but three fires in the last twenty years. In 1919, 10 acres were burned, in 1937, one acre, and in 1938, the fire was put out before one quarter of an acre had been burned over.

The forest has been acquired and improved by Tamaqua for water supply purposes only. No hunting, fishing or recreation is permitted. As a single use forest, this is an excellent illustration of what other communities can do. The capacity of the water system is 400,000,000 gallons and supplies a population of 14,000 persons with adequate pure water.

EMPLOYMENT POSSIBILITIES IN THE ANTHRACITE REGION

In June, 1939, the appropriation for forest economics research in the Forest Service, U. S. Department of Agriculture, was increased by \$18,000 for a survey of forest employment possibilities in the anthracite coal region of Pennsylvania. The money was later allotted to the Allegheny Forest Experiment Station, which covers Pennsylvania, Delaware, Maryland, and New Jersey, and has its headquarters in Philadelphia.

The immediate objective of the Survey is to determine how many of the unemployed of the region may be put to work in the near future on upbuilding of the present greatly depleted forest resources. Such upbuilding involves, among other jobs, a greatly intensified program of protecting the forest against fire, insects, and disease; planting of hopelessly denuded areas, as well as culm and refuse banks; restoration of wildlife; prevention of erosion, and regulation of run-off of precipitation, particularly as it affects the mine-water problem. The actual work would be directed by existing State and local agencies, insofar as possible from emergency funds. The Survey will indicate the possibilities and outline sample plans.

The long-term objective of the Survey is to determine how much labor, and of what kinds, may be effectively and economically employed in permanent forest industries, once the forest resource has been restored. By forest industries is meant not only mine prop and timber production, sawmills, and wood-using plants of all kinds, but also forest recreation, including hunting and fishing, and watershed management for water supply, flood control, and related purposes.

The cooperation of all State and local agencies working toward relief of unemployment and restoration of natural resources is essential to successful conduct of the Survey. The Wyoming Valley Chamber of Commerce was the original proponent of the work, and is giving it whole-hearted support.

Book Review

KINGDOM OF THE TREES

By ERLE KAUFFMAN. (Published May 11, Reilly & Lee, Chicago, \$2.00)

Here is the kind of book that modern, alert youngsters like best—one that tells them something true, yet tells it excitingly. There are endless fascinating things to learn about trees. Romance, science, history, tradition, economics, all play their parts in the story of trees. And Mr. Kauffman has told just the elements of this story that are of most interest to children. With equal parts of entertainment and instruction he describes various species of trees, tells where they are to be found, the numerous uses for the wood of each, a little of the botanical lore that explains their growth, and sketches in the roles they have played in history. This information is so skillfully lightened and simplified in the conversations between young Betty and Ben and their forester uncle that children will read them avidly and understandingly.

One delightful feature about this book is its appearance. There are some sixty-seven black and white drawings by Calvin Fader that portray trees, and convey the feeling of the landscapes in which they appear. The entire book is carefully and artistically designed from the shaded boxes in which the chapter numbers appear to the stirring pages on which gigantic redwoods sweep from bottom to top of the page, wordlessly impressing their size and majesty on the reader.

The last six pages are devoted to a table for tree identification that gives to either a child or an adult a complete and concise summary of tree characteristics. It gives just the right information to enhance the pleasure of boy or girl scout hikes, camping parties, or any trip a child may take.

For constructive enjoyment and palatable information for a child of about eight years or older, a parent or teacher will look a long while before he finds a better book than KINGDOM OF THE TREES. It seems ideally suited, too, to supplement school work. Shirley W. Allen of the School of Forestry and Conservation at the University of Michigan has written in the Foreword to the book, "What a splendid foundation for the formal teaching of conservation, which appears so frequently and in such a variety of subjects these days in the grade schools."

ASSOCIATION ANNOUNCES MEMBERSHIP INCREASE

We are happy to announce the following new members since January 1, 1940. Such an increase is most gratifying, as it indicates that the policies and activities of the Association are approved by the citizens of Pennsylvania.

The members of the Association should feel two responsibilities: First, to interest others in becoming members; and, second, to keep our Executive Secretary in touch with any activities in Pennsylvania which affect the program of the Association.

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The value of black walnut has always remained high. In 1926 it was quoted at \$20.00 a thousand on the stump; in 1933, \$25.00 a thousand and in 1937, \$22.00 a thousand. Frequently, more money is received for the stump than for the rest of the tree, since this contains the fine grain used in furniture making.

Between 1899 and 1909, 19,276,000 million feet, board measure, was cut from the forests of this state and it had an estimated value to \$346,806,000.

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1. The adequate protection of all Pennsylvania forests from Fire, Fungi, and Insects.
2. The personnel of the Department of Forests and Waters to be chosen and retained on a basis of efficient service only, in order to guarantee permanency of policy and continuity of action.
3. The management of the State forests so that they may supply the permanent needs of the people not only for continuous timber protection but also for recreation, hunting and fishing.
4. Greater co-operation between the departments of the State Government for protection of the beauty of the public lands.
5. Adequate biennial appropriations for the purchase, protection, and development of the State forests.
6. The education of the public, corporations, sportsmen, and forest land owners with respect to the value of our forests and the necessity for their development and proper utilization.
7. The planting of trees and other useful vegetation on waste and idle lands and the continued distribution of seedlings by the State.
8. The education of our children in forestry in both public and private schools. A love and appreciation of the forests tend to a better type of citizenship.
9. The establishment of town and county forests which will bring pure air, pure water, and recreation close to the centers of population.
10. The preservation of the few remaining areas of virgin timber in Pennsylvania.

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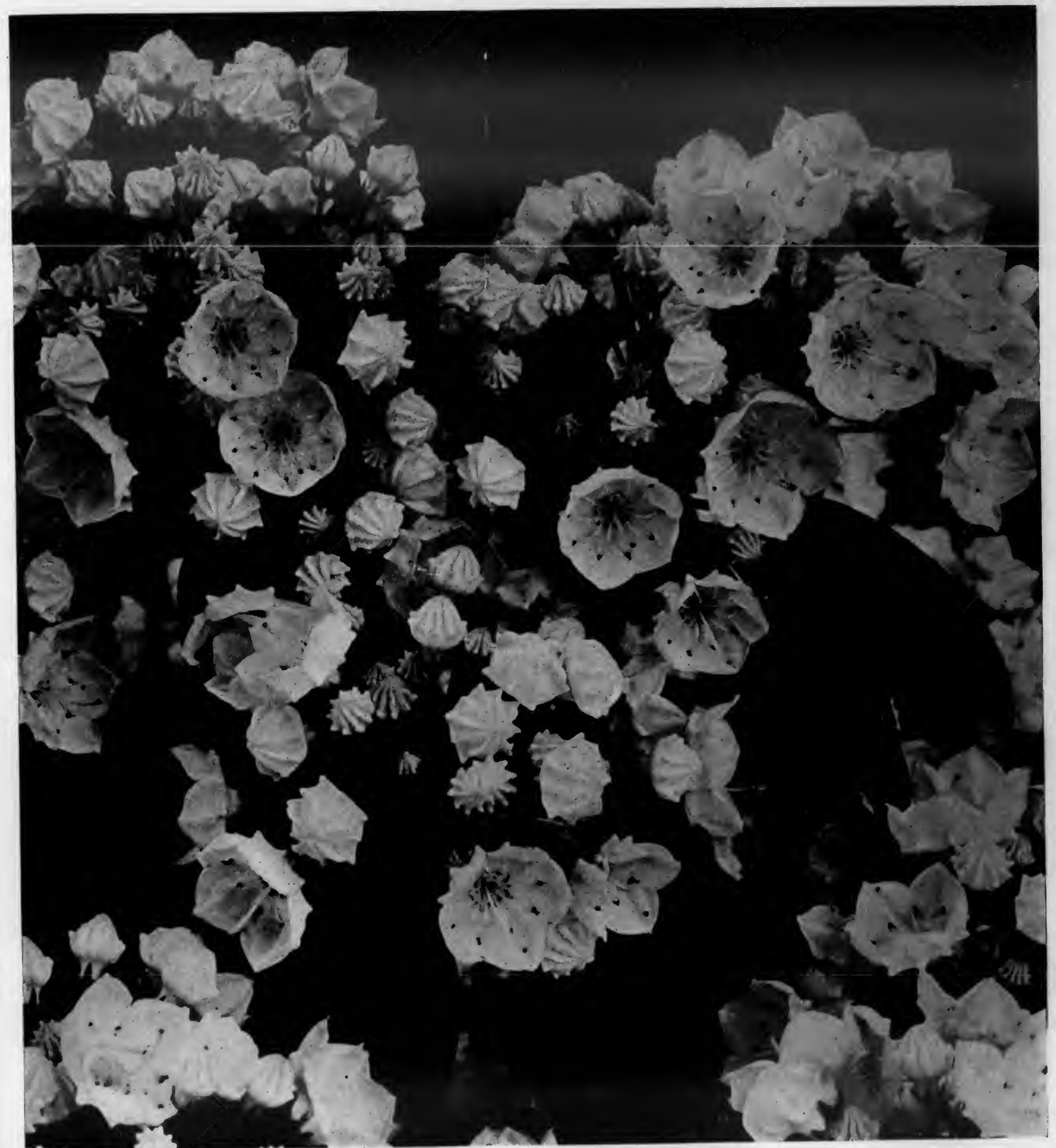
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THE PENNSYLVANIA FORESTRY ASSOCIATION

JULY-AUGUST

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THE PENNSYLVANIA FORESTRY ASSOCIATION

Founded in June, 1886

Labors to disseminate information in regard to the necessity and methods of forest culture and preservation, and to secure the enactment and enforcement of proper forest protective laws, both State and National.

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Neither the membership nor the work of this Association is intended to be limited to the State of Pennsylvania. Persons desiring to become members should send their names to the Chairman of the Membership Committee, 1007 Commercial Trust Building, Philadelphia.

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Wood Utilization in Adams County

By WALTER LEACH

DURING June, 1940, a wood utilization study was started in Adams county, Pennsylvania, and neighboring territory. In this survey an effort was made to learn the kind of wood and the amount being cut locally in the county yearly and the use made of the lumber. Also, information was gathered of the lumber shipped into Adams county, its source and the use made of it.

Some of the preliminary figures obtained in this wood utilization canvass may prove of interest. Adams county is largely timbered with hardwoods. A small acreage of red cedar is to be found in the neighborhood of Gettysburg. Scrub or Virginia pine is present to the northeast of Gettysburg, toward East Berlin; and white pine and hemlock are worthwhile components of the Buchanan Valley forests in the north-western part of the county.

Much of Adams county is rolling cleared land with but small woodlots on the lower ground along the streams and on the rougher and stony places. The western edge of the county is mountainous. Here unbroken forest land reaches for miles along South Mountain. A large proportion of this back area of woodlands is held in State Forests. Between the rough mountains of the western rim of the county and the nearly level wheat fields of the eastern section are the wonderful orchards of apples, peaches, cherries and berries. Due to the protection of these orchards, Adams county has been spared the more serious phases of soil erosion occurring on cleared lands on rolling hillsides in other parts of the state and nation where fruit growing is not the main industry.

For the purposes of the wood utilization survey of Adams county, the field may be divided

into six portions. (1). Adams county lumber and wood. This is cut and made ready for use by local sawmills, shingle mills, lath mills and planing mills and as fuelwood, locust posts and pulpwood. (2). The retail lumber yards. These sell mostly western and southern finished lumber. (3). The local manufacturing of wood products into apple crates, furniture, barrels and cigar boxes. (4). The public utility company use of wood in many forms. Railroad ties, telephone and telegraph poles, and the State Highway guard posts, bridges and snow fences. (5). The berry and fruit basket and vinegar barrel industry. (6). Miscellaneous users of lumber and timber.

Adams county has a total of 37 sawmills. These mills have a daily capacity of from 500,000 to 1,000,000 feet of lumber. Twenty-three of the mills do custom work, sixteen doing little other sawing. Farmers and woodland owners, either neighbors or from as far as ten miles distant bring their logs to these mills and haul the rough sawed material home to be used in general farm building, upkeep and repairs. Inch boards may go into new outbuildings; fences and plank into barn floors and hog troughs. Here a new barn has been built entirely of timber from the farm woodlot; yellow poplar for siding and white oak for frame material. The average price paid by the farmers for custom sawing of their logs varies from \$6.50 to \$10.00 for each thousand feet mill cut. The higher price is charged for the larger logs and for the fence row trees which frequently have concealed nails that make trouble in the sawmill. One custom mill operator will call for the logs at the farm and deliver the lumber in return, all for \$15.00 per thousand feet. The average annual custom sawing work in

Adams county approaches 750,000 feet, twenty of the twenty-three mills being in operation in June, 1940. The hardwoods sawed into timber are red, white, pin and rock oak, and yellow poplar, while the conifers are white pine, hemlock and Virginia scrub pine. Black locust for fence posts is pointed at the mills or squared up when desired.

Occasionally the farmers of Adams county need to have some of their boards planed for siding or flooring. Five planing mills in the various sections of the county will plane the lumber at an average price of one dollar an hour. This amounts to around \$2.00 per thousand feet, depending upon the kind of material to be planed. Upwards of 100 to 200 thousand board feet of lumber are planed each year in such custom work.

At present there are fourteen portable sawmills that move from place to place in Adams county and seven of the mills, including the custom sawmills, either will move or do part time work for the owners on their woodlots. In some cases the mills belong to farmers who are only taking out the declining or ripe trees. To augment these, the farmer may buy a small amount of neighboring timber. For the other mills, moving from tract to tract, the timber is purchased mostly in lump sum on the stump. The sawmill men purchase their timber to the best advantage. Prices that can be allowed for stumpage vary with the tree species, size of timber, markets, and difficulties of lumbering. Yellow poplar was quoted at \$6.00 to \$10.00 a thousand on the stump for mill cut. Sizeable white and pin oak for cross ties was rated in one instance at \$11.00 per thousand.

The past cut of the portable mills has run well over 2,500,000 feet yearly. In 1940 the market is reported as very dull, one of the worst known.



Photo Soil Cons. Serv.
S. W. Fitzgerald's Mill with logs from local woodlots.

Two

The anticipated cut appears to be 1,500,000 feet. Three of the portable mills are idle. The working of the compensation and social security laws is stated as one of the reasons for going out of business. Compensation costs have been reduced a third in 1940 which may stimulate activity.

Prices received for Adams county lumber in the rough, as coming from the saw, vary from around \$25.00 a thousand feet for oak and other hardwoods in boards to \$38.00 and \$45.00 in larger frame materials; and from \$28.00 a thousand for white pine boards to \$45.00 for the heavier timbers.

The six shingle mills in Adams county were found to be almost or entirely idle. Some were doing a small amount of custom sawing of white or pitch pine shingles at a price of \$2.00 per thousand. One shingle mill owner was using sassafras and yellow poplar for new shingles for his own barn. The lath mills too were nearly idle. These idle mills show the shifting times and the result of the use of substitutes and of outside competition.

Sixteen fuelwood dealers are located in Adams county. The general range in price charged for 12" hardwood (128 cubic feet for a cord) was from \$5.00 to \$6.00 a cord delivered to the purchaser, in some cases over six miles. Oaks and hickory make up a major portion of the fuelwood. Some 20" wood for fireplaces and selected knots and chunks for furnace wood formed part of the fuel products. The fuelwood is obtained in many ways. For example, young or polewood hardwoods, frequently sprout growth, may be clear cut or thinned for fuelwood. Or when older stands are sawed into lumber the tree tops and defective material are utilized for fuelwood. In addition each sawmill sells slabwood for fuelwood. A thousand feet of lumber often produces $\frac{1}{2}$ to $\frac{2}{3}$ cord of slab wood. This is sold at the mill as low as \$1.50 a cord for hemlock and white pine and \$3.00 for oaks. The fourteen fuelwood dealers talked with, handle 1,500 cords yearly. In addition most of the farmers use wood for fuel and cut their own wood. The total consumption of fuelwood each year in the county is tremendous in spite of the report that bootleg coal has cut into the business as a competitor.

Two operators were found who cut locust timber for state highway guard posts. One of these men plans to harvest 5,000 posts in 1940. The specifications call for posts from 6 to 9 inches in diameter at the small or top end and 6 or 7 feet long. The delivered price to the middleman is from 33 to 53 cents each, depending upon the

(Continued on Page 13)

FOREST LEAVES



TICKS have been known for a long time to be of economic importance as vectors or carriers of some of our most serious diseases of man and animals, but it is comparatively recently that more and more people have become conscious of the fact that these creatures may be dangerous parasites because of their ability to transmit diseases from some of the wild animals to man. In addition to their ability to disseminate disease, all ticks are parasitic and weaken their hosts by sucking blood and by irritating them by means of their bites. We also have a few ticks which secrete a poisonous substance which injures their hosts (man and animals) at the time of the bite.

In heavy infestations the direct loss due to ticks is frequently quite large. Evidence has been presented that female ticks may take up to a hundred times their own weight in blood. Theiler observed that in three days' time over fourteen pounds by weight of engorged ticks dropped from a badly infested horse. It also was estimated by the Federal Bureau of Animal Industry that a 1000-pound steer heavily infested with the Southern cattle tick will lose 200 pounds of blood to ticks annually. Fortunately, the latter (the Southern cattle tick) practically has been eradicated from the South. On June 30, 1939, only fifteen counties out of a total of 985 counties, which is approximately two per cent of the original area under Federal quarantine in 1906, remained infested.

Ticks are not true insects, but are more closely related to mites and spiders. They are sac-like forms with eight legs in the nymph and adult stages, and measure slightly less than a quarter of an inch when unfed. They are flattened and bear a superficial resemblance to the common bedbug. The sexes are dissimilar in that the males have the entire dorsal surface covered with

Ticks

By H. M. MARTIN

School of Veterinary Medicine,
University of Pennsylvania.

a hard plate, whereas this is much reduced in the female and covers less than half of the anterior end. Fully engorged female ticks take on a very different appearance and become greatly distended and ovoid, resembling bluish-gray to brown beans about half an inch or more in length. They lack a true head but in one family, the family containing most of the important forms found in the woods and fields heavily overgrown with weeds and brush, the mouth parts are at the anterior end of the body and are so united as to form an apparent head or what may be technically called the capitulum (false head). The mouth parts are made up of several individual units, some of which play an important part in the tick's obtaining food (blood) from its host. Both sexes attach themselves to the skin by means of a toothed, dart-like organ, the "hypostome," through which they imbibe the blood of the host. Blood of mammals (including man), birds and reptiles constitute the only diet of ticks, and without food they are unable to complete their development. Many forms are remarkably hardy in that they can live two years or more without partaking of food.

Life History and Habits

The life histories and peculiar adaptations of ticks to their environments are interesting, and a knowledge of them is important from the standpoint of reducing the tick population and combating tick-borne diseases.

There is remarkable variation in the complicated life histories of the different species. However, in general ticks have four distinct developmental stages; the egg, six-legged seed or larval tick, nymph and adult male and female. All ticks require blood for their development and reproduction. In many cases three separate hosts are needed to complete development, the ticks dropping off between each blood meal in order to transform to the next stage; such forms are known as three-host ticks. Others complete their life cycle on a single host, that is from the seed

(Continued on Page 11)

JULY - AUGUST, 1940

Three

FOREST LEAVES

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The PENNSYLVANIA FORESTRY ASSOCIATION
Disseminates information and news on forestry
and related subjects.

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JULY-AUGUST, 1940

FORESTRY SUPPER

ELSEWHERE in this issue will be found an announcement of three symposia on phases of the broad problem of conservation to be held on the 17th and 18th of September at the University of Pennsylvania. This is part of a comprehensive program to be presented during the week of September 16th in commemoration of the bi-centennial of the founding of the University.

Those presenting papers on conservation subjects are men preeminent in their field, whom many members of The Pennsylvania Forestry Association will wish to hear. You are all cordially invited to attend the week's celebration and we urge you to be present at these conferences.

Because we know that many of you will plan to attend and because it is felt that you might wish to meet the men taking part, the Association plans to hold a reception to be followed by supper on the evening of September 17th, at "Cressbrook Farm," Valley Forge. This is a beautiful property adjoining Valley Forge Park, which has been offered by its owner, Henry N. Woolman, to the University in the hope that eventually some of its activities will be transferred from Philadelphia.

Detailed information as to the program, cost of the supper, transportation from Philadelphia to Valley Forge, and other matters will be mailed to all members of the Association shortly.

Four

HAVEN METCALF

DR. HAVEN METCALF, principal pathologist in charge of the Division of Forest Pathology, Bureau of Plant Industry, died Thursday, May 23.

Dr. Metcalf was born at Winthrop, Maine, August 6, 1875. He was educated at Colby College, Brown University, Harvard University, Indiana University, and the University of Nebraska. He took his Ph. D. degree at the last named institution under Dr. Charles E. Bessey. He taught at Brown, Tabor College, Iowa, and Clemson College, S. C. He entered the Bureau of Plant Industry in 1906 and in 1907 organized the office of Forest Pathology, which, as the Division of Forest Pathology, he has continued to lead. He was a splendid investigator, cooperator, organizer of research and administrator. Pennsylvanians will remember him especially for his participation in and able direction of the research on the chestnut blight and the campaign against it. Equally notable, however, was his organization and development of the research in this country against other introduced and native forest and shade tree diseases. He developed a close cooperation with forest and shade tree organizations as well as the Federal and State agencies interested in the health of trees. In his death foresters and arborists have suffered a severe loss.

WOODSMEN GO WEST

The westward shift of the lumber industry is reflected in a U. S. Forest Service compilation of mill production from 1800 to 1935. Over the entire period the East has supplied more than four-fifths of the American lumber, three-fourths of which was softwoods and one-fourth hardwoods. At present, however, nearly half the lumber cut is from the western softwoods, which include Douglas fir, ponderosa pine, white pine, hemlock, spruce, and redwood. The central region has supplied more than 40 per cent of the hardwoods. The cut from 1900 to 1935 was more than half the cut for the previous century, but the mill value for the 35 years was considerably greater than half of the 38 billion dollars which was the total estimated mill value of the cut for the 135 years.

Birds are banded by the U. S. Biological Survey for the purpose of gaining knowledge of their migration and other habits. All details about them should be reported to this Bureau in Washington.

FOREST LEAVES

Conservation Conference, University of Pennsylvania

By J. R. SCHRAMM

1940 marks the 200th anniversary of the founding of the University of Pennsylvania. This fact is being impressively observed by a Bi-centennial Celebration. This observance, marked by many events beginning early in 1940, comes to a climax in the week of September 16, 1940. Among numerous activities during this week there will be a series of symposia on diverse subjects. These round tables or conferences have been formulated and organized by the academic departments of the University. Among these is a series of especial interest to members of The Pennsylvania Forestry Association—three half-day symposia on the general subject of *Some Fundamental Aspects of the problem of the Conservation of Renewable Natural Resources*. This program has been organized by the Department of Botany with the cooperation of the Allegheny Forest Experiment Station and others interested in conservation. It will be recalled that Joseph T. Rothrock, a pioneer in the Conservation movement, was Professor in the Department of Botany of the University of Pennsylvania.

In organizing the symposia the endeavor has been to select subjects that have a fundamental bearing on more or less the entire problem of Conservation of Renewable Natural Resources. The program is as follows:

Some Fundamental Aspects of the Problems of the Conservation of Renewable Natural Resources

Tuesday forenoon, September 17

Subject: The Natural Vegetation of the United States as a Guide to Present Day Agricultural and Forestry Practice.

Chairman: Raphael Zon, Director of the Federal Lake States Forest Experiment Station and Professor of Forestry, University of Minnesota.

Principal Speakers:

Gustaf Adolph Pearson, Senior Silviculturist, U. S. Forest Service, Tucson, Arizona.
William Skinner Cooper, Professor of Botany, University of Minnesota.
Homer LeRoy Shantz, Chief, Division of Wildlife Management, U. S. Forest Service.

Tuesday afternoon, September 17

Subject: Climatic Cycles in Relation to the

Theory and Practice of Conservation.

Chairman: Charles Greeley Abbot, Secretary of the Smithsonian Institution.

Principal Speakers:

Paul Bigelow Sears, Professor of Botany, Oberlin College.
Andrew Ellicott Douglass, Director Emeritus of the Steward Observatory; Professor of Astronomy and Dendrochronology, University of Arizona.
Ellsworth Huntingdon, Research Associate, Yale University.

Wednesday forenoon, September 18

Subject: The Administrative Task of Conservation—Public and Private.

Chairman: Morris Llewellyn Cooke, Consulting Engineer and President of the "Friends of the Land."

Principal Speakers:

Henry A. Wallace, Secretary of Agriculture.
Samuel Trask Dana, Dean of the School of Forestry and Conservation, University of Michigan.
Julian F. McGowin, Second Treasurer, W. T. Smith Lumber Co., Chapman, Alabama.

WOOD WASTE RECLAMATION

WITH Canada at war and every effort being put forth to obtain the maximum use of natural resources, the Dominion's great pulp and paper industry is keenly alive to the necessity of curtailing waste, wherever economically possible. Waste reclamation is receiving special attention from the Forest Products Laboratories, Department of Mines and Resources, and many significant developments towards this end have taken place in recent years.

Screenings in pulp mills formerly considered as waste are now treated in special refiners to produce fibres suitable for making board fillers, corrugating paper, newsprint, and building board. In some paper mills fine fibres, formerly lost in mill effluent, are now recovered by various means, of which air flotation is the most striking. In Canadian mills waste liquor from sulphite pulping now yields baker's yeast and vanillin.

Much previous waste has been eliminated by improvements in methods of processing, but a great deal yet remains to be done in this direction in Canada as each year more than a million tons of solids dissolved out of pulpwood by the sulphite process are discharged into Canadian waters.

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Colerain State Forest Park

T. ROY MORTON

THE Colerain State Forest Park, in the Logan District, is located on a beautiful spot along Spruce Creek, about two miles northeast of the village of Spruce Creek, which is located on State Highway Route 45, between Water Street and State College. It takes its name from the Colerain Forge which stood for many years, a short distance from this site and was one of the largest forges of central Pennsylvania.

This Park affords an excellent place for tourists to pause and rest, and is an ideal spot to camp or spend a day. An abundant supply of pure, cool, mountain water has been piped to all parts of the Park, and fireplaces, tables, benches, and shelters are maintained by the Department of Forests and Waters for the accommodation of visitors.

To fishermen, this Park is a paradise, for in the cool, clear waters of the Spruce Creek lurk the wily trout, brown, rainbow, and brook. For the swimmer, there is an old-fashioned swimming hole and a comfortable bath house.

The hiker will find a winding trail along the

foot of the mountain at the edge of the creek, leading him to the Ice Cave Gap, where ice may be found throughout the year. Another trail, marked with a Yellow Arrow, leads to the top of the mountain to an old Indian lookout. Tradition has it that the Indians used this point as a lookout for enemy tribes who occasionally invaded the peaceful valley. Because of the visibility of the Highway from this point, it has been said that the famous bandit-robber, David Lewis, also, used this lookout for stage coaches and payroll carriers. In the early days the employees of the forges and coal and iron furnaces, were paid, in cash, by a carrier who usually rode horseback between Bellefonte and Spruce Creek.

The person who merely wants to rest will find peace and quietness among the shade of the large hemlock trees at the edge of the Park along the foot of the mountain.

The Colerain Road, one of the finest mountain roads, in the State, takes one from this Park across Tussey Mountain, to the famous Diamond Valley. Along this road are several vistas with views unequalled anywhere in the State.

FOREST LEAVES

Six

Is Tree Care Necessary?

H. GLEASON MATTOON

FREQUENTLY I have heard it said that all of the to-do about care of trees has been stimulated by tree care companies—that our trees and shrubs would be better off if we would let them alone. In our grandfather's time, these people continue, trees received no care and thrived.

From the landing of the pilgrims until about 1880 the forests of this country were considered inexhaustible. Trees were things to be cut and burned, to make way for a home, farm or manufacturing plant, or to be cut and sawed into timber for that home or factory. Only when the conservationists raised their voices in protest against this ruthless destruction did people begin to realize that trees were assets rather than liabilities. Public appreciation of their economic and aesthetic value took form during the early part of this century.

Our trees then, ceasing to be weeds, have acquired a monetary value, either because we have paid money to have them planted or because their presence increases the value of the property. Since trees have a monetary value, we conserve our estate by protecting them against decay and destruction just as we do when we paint our house to preserve it. The aesthetic value can not be put down in dollars and cents but it is equally important.

There is more to the picture, however. When grandfather was a boy chestnut blight and the Japanese beetle had not left the Orient. Dutch elm disease, the elm leaf beetle, the gipsy moth, the brown tail moth, San Jose scale, elm soft scale, golden oak scale and other foreign insects and fungi had not found residence within our gates. In fact, could we but estimate the sum expended to control these foreign pests and the losses caused by them each year, I believe the figure would have as many digits as the interest on our national debt.

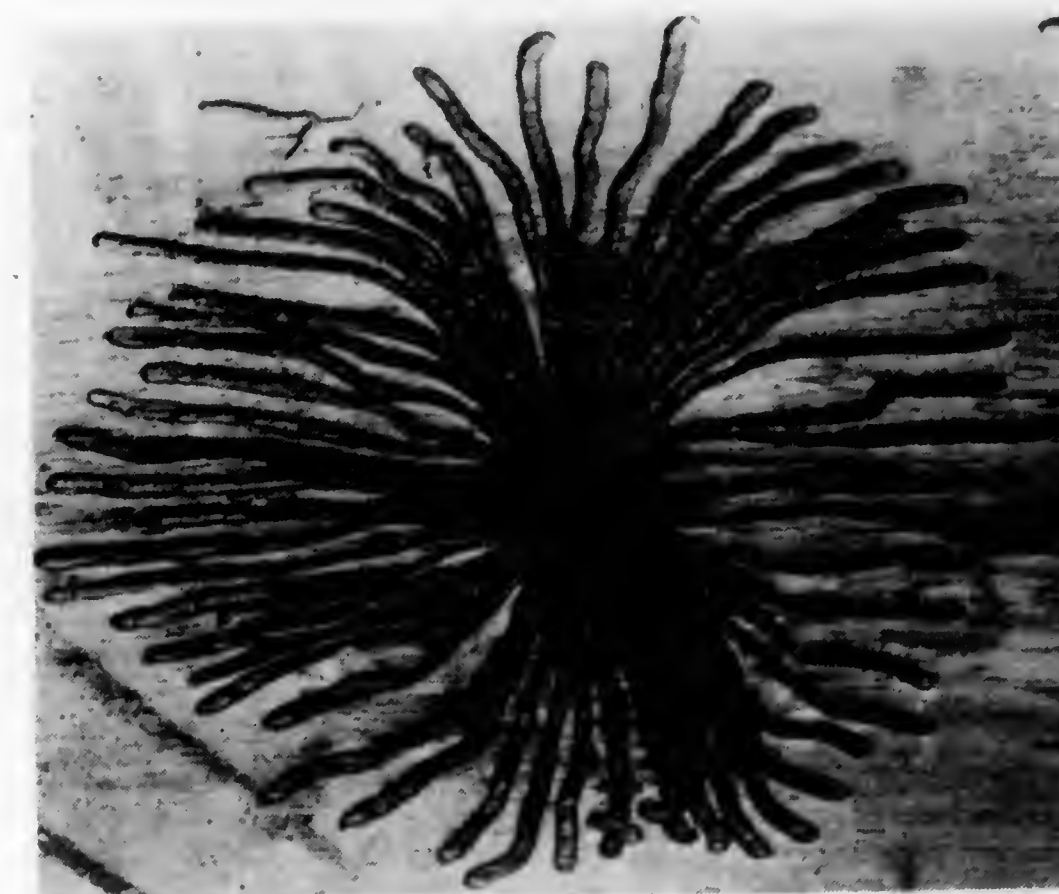
As their enemies are increasing, it is obvious that greater attention must be given our trees if they are to be preserved.

Some trees and shrubs are susceptible to attack by more serious troubles than others. It is also true that trees and shrubs growing under adverse soil or moisture conditions usually become the prey of insects or diseases before those growing under ideal conditions.

Whether an artist uses charcoal, water color or oil, he must know the limitations of his medium. So one choosing trees and shrubs should know the weaknesses as well as the strength of his material if he is to create an enduring picture.

I have mentioned the great cost of controlling the exotic enemies of trees, that is those that are not native to this country. The pity of it is, this great burden of cost is due to the belief that shade and ornamental trees need little or no care and to the inherent lethargy of a democratic form of government. For example, if prompt action had been taken in 1916 when first the destructive possibilities of the Japanese beetle were observed on the banks of the Delaware near Riverton, New Jersey, this beautiful scarab-like insect would today be unknown to the populace.

The few adults that emerged from chrysalids brought to this country from Japan could have been destroyed with comparative ease. It was governmental delay which let the havoc spread so that now millions of dollars are expended each year in attempts to control it. Notwithstanding this effort, the Japanese beetle will, undoubtedly, encompass the United States before many decades have passed. I describe the Japanese beetle as beautiful. Many other adjectives less complimentary in nature have been applied



Galleries of the Elm Bark Beetle, which carries Dutch Elm Disease from one tree to another.

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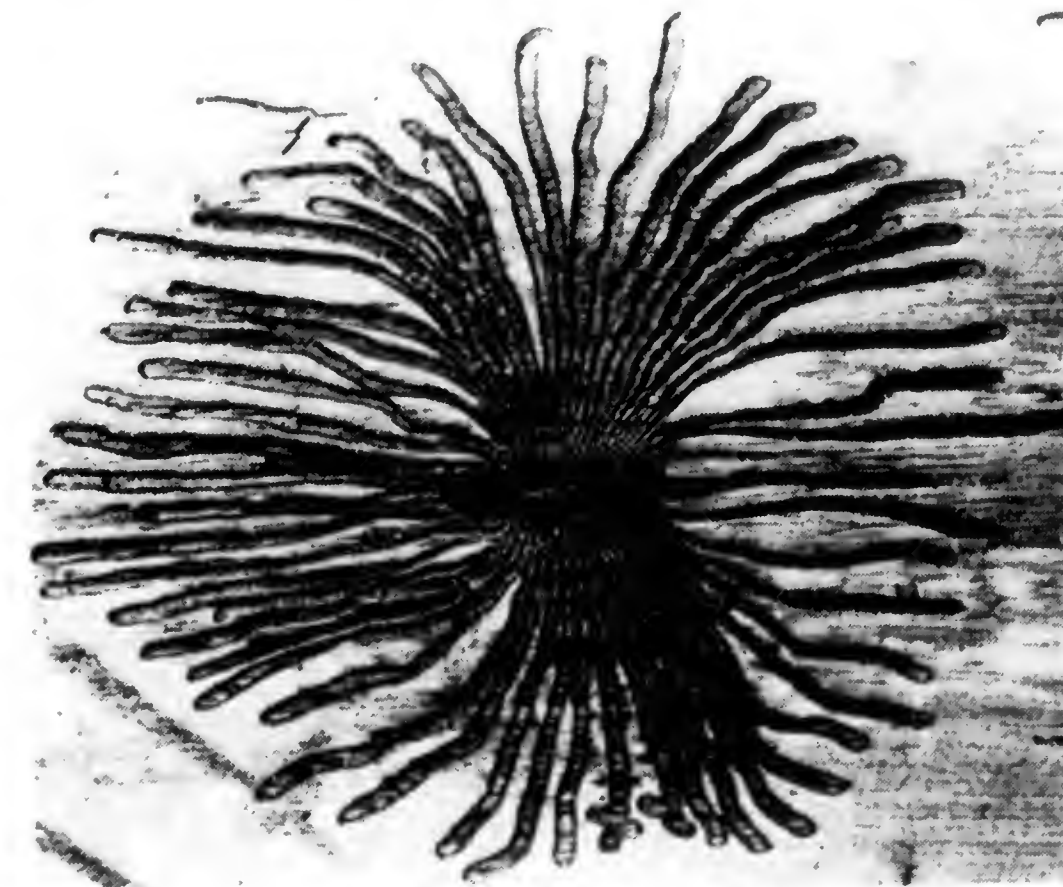
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Seven

to it. Yet in its native land this pest is so little known it has no common name. Its rarity in Japan and abundance here supplies us with a clue to the whole problem of tree care. It is the story of the infinite multiplicity of nature maintained by an intricate and delicate system of checks and balances.

The life of the white-marked tussock moth (an insect that feeds on foliage of trees and shrubs) is an example. No less than 21 parasitic insects have been identified, which destroy this insect. In addition 14 hyper-parasites have been found, insects which destroy the parasites, while 4 parasites of the hyper-parasites are known. It is quite possible that there are also parasites of the parasites of the hyper-parasites. Complicated isn't it?

This is not all. In maintaining a variable status quo, nature has also devised innumerable checks among birds, animals, insects and fungi—cross checks in every conceivable way. A fungus to destroy an insect—a bird to devour an insect—an insect to kill a bird—an insect to eat a



White Pine blister rust, an exotic disease, highly destructive of this valuable native species of tree.

fungus—animals to devour insects, fungi and birds, ad infinitum.

When an exotic insect reaches these shores, its predatory or parasitic enemies are not usually brought with it. In Nippon, there are no less than 7 parasites of the Japanese beetle, living upon different stages of growth, not one of which was brought here with this pest.

Here let me make it clear that like the Japanese beetle most insects pass through four stages of development. Each starts as an egg. The egg hatches into a grub, sometimes called a caterpillar or worm. Next the grub or caterpillar or worm, which ever you wish to call it, enters a period of growth (this is the only stage in which it does grow), completed by the formation of a cocoon or chrysalid properly called a pupa. From the pupa emerges a beetle, butterfly, bee or other form of insect life.

The "worm" that devours the leaves of your catalpa trees and the one that eats holes in your carefully stored overcoat will both change to moths, though not of the same species. The "worm" which devours your lawn will become a beetle. The "worm" that eats the leaves of your pine tree later becomes a saw fly. So you see the worm will turn—into a butterfly, beetle, bee or other "bug."

Obviously, were it not for foreign enemies our trees would require little care. Through the years they would grow naturally into graceful old age and die when they had passed their prime. But we have the exotic troubles with us and we are not willing to let trees die when they have reached old age. On the contrary, in age they have a greater value, both sentimental and aesthetic, hence our desire to preserve them is greater.

Furthermore, we have not been content with native material. Our acquisitiveness leads us to demand trees and shrubs from Africa, Europe and the Orient. With this foreign plant material, foreign pests have come. We demur at the cost of holding these foreign pests in check and at the same time complain about the quarantine methods the authorities use in trying to protect us from them.

In 1880 the orchardists in Maine thought little of the discovery of a small Asiatic scale insect in San Jose, California. Yet by 1895, but 15 years later, this tiny creature only one-sixteenth of an inch in length had traversed the country, leaving dead and dying orchards to mark its journey to the East. This insect now known as San Jose scale after the place of its discovery, is catholic in its taste. Entomologists list more



An autogyro scouting for the yellowing leaves on Elm trees which indicate the presence of Dutch Elm Disease.

than 150 trees and shrubs which it attacks.

I have mentioned the insect enemies of trees, both native and exotic, and have outlined their various stages of developments. The susceptibility of a tree to attack by injurious insects depends upon its vigor and the conditions under which it is growing. In all plants the food and water relations, injuries, and weather, play an important role in determining their health or disease and death. That the soil must contain a proper supply of plant food and be of a texture which will conserve water and permit air, that are necessary for healthy root development, is too often not appreciated. Adverse soil conditions, poisonous gases, and smoke are the primary reasons why trees grow more slowly and die sooner in or near cities.

Like man and animals, trees are susceptible to specific disease microbes, microscopic bacteria, which attack the living cells thereby retarding or destroying their normal functioning. Likewise in trees there are a large number of fungi capable of invading the living tissue and causing functional disorders, which we know as disease. A fungus is a low form of vegetative life which

gets its food through the breaking down of the cell tissue of the tree. It contains no chlorophyll or green coloring matter so it can not manufacture its own food.

Leaf spots and blights, twig blights and cankers, wood decays and other diseases are puzzling to laymen unless they understand that invisible parasitic plants are growing in and destroying the living tissues of the trees.

While the number of fungous enemies of trees may not be as great as that of insect enemies, they are frequently more difficult to control. So far, no means has been found to kill a fungus once it becomes established in a tree. The fungicides which are advertised are preventives rather than curatives, that is an application of a fungicide on a tree will prevent the spores or "seeds" of the fungus from germinating and growing in the tree.

In subsequent articles Mr. Mattoon will discuss specific troubles of trees. If you have a particular tree trouble about which you would like to know, send a sample to The Pennsylvania Forestry Association office, 1007 Commercial Trust Building, Philadelphia, with a letter giving detailed information.



George W. Childs State Forest Park

E. C. PYLE

GEORGE W. CHILDS PARK still remains one of the most beautiful natural beauty spots in Pennsylvania. The natural splendor embodied in these fifty-two acres has attracted 15,000 to 20,000 visitors annually for the past five years with its utilization still increasing. The Park is located in Pike County, Delaware Township, Pennsylvania, in the Pocono Mountain region.

It is only three miles northwest of Dingman's Ferry on the Porter Lake Dingman Pike. It can best be reached over U. S. Route 209 either south from Milford or northeast from Stroudsburg. It is 90 miles from New York, 120 miles from Philadelphia, 65 miles from Bethlehem and Allentown and Scranton.

Childs Park remains free to the general public by virtue of the gift of 52 acres by Mrs. Emma B. Childs, widow of George W. Childs, editor of the Philadelphia Public Ledger prior to 1912. The gift was made May 22, 1912 in fulfillment of the wishes of Mr. Childs that it be made a public recreation ground, prohibiting the use of firearms thereon. This was the first forest land dedicated to recreational purposes ever given to

the Commonwealth for administration by the Department of Forests and Waters.

Due to the uniqueness of this area, the Dept. of Forests and Waters has endeavored, in its administration, to preserve its beauty by prohibiting the development of modern concession stands and facilities such as play fields for soft ball, tennis, and etc. The facilities for the public are those only essential to good health while visiting the area for the day. No over-night camping has been permitted for the past five years due to lack of suitable camping space. For the day user adequate latrine facilities are available. Drinking water is provided by two deep well pumps and one spring. There are twelve open fireplaces with 45 picnic table-bench combinations. The natural pool directly under Factory Falls makes a delightful bathing pool for small groups who come in from neighboring cottages and camps. There are no bathhouse facilities or life guard protection and for this reason bathing is discouraged. Two large 20'x20' shelters afford visitors some protection from the elements. Probably the most delightful part of the park

is the 1½ miles of foot trails thru the glen of mixed hardwoods and hemlock above the rock, mosses, lichens, ferns, rhododendron, laurel and other shrubs. The park contains three beautiful waterfalls. The first known as Factory Falls is made up of series of small cataracts with falls between. The second known as Fulmer Falls is made up of two short falls on a curve which in high water tend to fill the whole rock cavity with white spray and foam, a most unusual display within the natural rock strata and green and brown flora. The third known as Deer Leap Falls is a short falls, then a direct drop representing a short step and a leap as a deer might make in flight over an obstacle.

A park guard lives in a log cabin within the park the year round, but is on duty only in the summer months. A small registration booth may be found directly inside the gateway where visitors are requested to register.

One of the interesting items of history of the area is that connected with the old mill walls still standing near the entrance to the Park. Here back in the middle of the 19th Century was operated a woolen mill powered by water from the Dingman Creek. The old mill race is still in evidence. The mill was built because of the importation of special breeds of European sheep into the surrounding country. However, it operated only a short period because the wool supply became exhausted due to the killing of sheep by wolves and the poisoning effect of a steady laurel diet.

Camping accommodations, refreshments and camping supplies may be found on private land adjacent to the Park. Hotel accommodations may be secured at Dingman's Ferry, 3 miles away. The nearest State Forest Public Camp Ground is at Pecks Lake about 12 miles west just off Pennsylvania Route 402.

Ticks

(Continued from Page 3)

tick stage to completely developed adults. The eggs are about one-fortieth of an inch long, oval and are yellowish to brown in color. The eggs are deposited in masses varying in number from hundreds to 10,000 or 11,000 by a single female. The eggs develop and hatch into six-legged seed ticks. After a meal of blood the larval ticks molt their skins and the four-legged forms known as nymphs make their appearance. In some forms several nymphal stages occur, the molts following blood meals. Following the final nymphal molt the adult males and females come forth.

In most species both sexes attach to their hosts. The female attaches to the host, and the elastic posterior part of the body stretches so that when fully engorged she is little more than a sac of blood, the capitulum and legs appearing relatively small. Mating usually takes place on the host. When fully engorged the female releases her hold on the host and seeks a protected place to lay her eggs.

The habit of some ticks in dropping off their hosts to molt and finding a new one following the molt gives them an opportunity to pick up infection from one host and to transmit it to another. This habit also makes it more difficult to control. In the case of the ticks that complete their life cycle on a single host, some are able to transmit disease hereditarily; i. e., from one generation of ticks to the next, through the eggs. Some species of ticks will engorge on many different species of animals while others are very much restricted in this respect. These factors also are important from the standpoint of transmission of disease and one's ability to control them, as it is obvious that a species of tick (e. g., the American dog tick) which attacks any animal with which it comes in contact is more difficult to control than the one which attacks only a few kinds of animals (e. g., the Southern cattle tick).

Longevity of Ticks

Ticks as a rule are rather long-lived. The length of life without food in various stages of ticks is of considerable economic importance in that it must be considered when one attempts to destroy these pests by starvation. Many species will live upwards of eight months in closed containers without food or water. This is true of all stages of ticks. In their native habitat the nymphs live upwards of a year and the adult Rocky Mountain spotted fever tick, if unfed, may appear in search of a host for as many as four seasons.

Distribution and Their Relation to Disease

Ticks are almost world-wide in their distribution and more than 400 species have been described. In this country approximately 40 species have been recorded, nearly half of which are known to be of more or less economic importance and some of these have been definitely incriminated as disease carriers among our domestic and wild animals and to man. Four different types of disease organisms are known to be carried by ticks; namely, spirochaetes, piroplasmas, rickettsias and bacteria, all of which are microscopic in size. In addition to the above disease-producing microbes, they have been incriminated

as transmitters of virus diseases and certain parasitic worms. Fortunately, in this country there are comparatively few diseases affecting man and animals which are transmitted by ticks. Probably the diseases causing the greatest alarm among the public in recent years are tularemia, a bacterial disease; and Rocky Mountain spotted fever, one of the rickettsial diseases of man, which is carried exclusively by ticks.

Rocky Mountain spotted fever is a very serious human disease which is transmitted to man entirely by ticks. This disease has been known for a long time in the Rocky Mountain region and until recently was considered more or less a disease of that area. However, in the past few years it has been making its appearance in other localities, so that at the present time endemics or isolated cases have been reported from coast to coast; and according to Parker, spotted fever is endemic in at least 39 out of the 48 states.

There are a number of ticks which have been incriminated as transmitters of this disease under natural conditions, and others have been shown to be capable of transferring it experimentally from an infected animal to a healthy one. The ticks of most importance as carriers of this disease to man are the ones commonly known as "wood ticks." In this country we have eight

species belonging to this group (*Dermacentor*), the majority of which may be capable of transmitting the disease; but those chiefly associated as transmitters of this infection are the *Dermacentor andersoni* (Rocky Mountain spotted fever tick) and the *Dermacentor variabilis* (American dog tick or Eastern wood tick). The former is restricted to the northwestern part of our country, and is the important vector of spotted fever in that area. In addition to spotted fever, it also has been incriminated as a transmitter of other diseases of animals and man, including tularemia, American "Q" fever, tick paralysis, etc. The Eastern wood tick has a range from the east coast west to a line drawn from Eastern Montana to Eastern Texas and the Gulf of Mexico. It is found also in isolated places in the Pacific Coast states. In addition to this group we have other ticks that may act as vectors, especially among rodents (field and woods mice, rabbits, etc.), which are the fountain-head of many tick-borne diseases. The *Dermacentor* group, or wood ticks, are members of the three-host ticks, the larval and nymphal stages feeding as a rule upon rodents or small animals; therefore, it is the adult that usually plays a part in the transmission of disease to man. The feeding of immature stages on animals infected with a disease carried by



Female of the American Dog Tick with mass of eggs. The tick dies after depositing a single mass like this (much enlarged).

ticks to man or other animals will carry the infectious agent through to the adult form and transmit it to the new host. When the adult tick feeds on an infected host, it has the ability to transfer the organism, in some instances, at least, to its eggs, thus carrying it through the various life history stages (eggs, seed tick, nymph and adult).

The American dog tick (*Dermacentor variabilis*) and some other species in all probability are capable of transmitting the same diseases shown to be transmitted by the Rocky Mountain spotted fever tick (*Dermacentor andersoni*).

The tick season usually begins in the early spring, and in some parts of the country reaches its height in April and May. In the Eastern states the height of the tick season is probably in May and June, the population becoming reduced through July and August and the majority having disappeared by September.

In connection with ticks and diseases it should be remembered that not all ticks come in contact with tick-borne diseases and therefore will be harmless. There are many regions in which tick-borne diseases do not occur, but these creatures always should be looked upon as potentially dangerous, and proper precautions should be taken against bites by these parasites.

Prevention and Control

Probably the best way to avoid ticks and tick bites is to stay out of the woods and brushy, weedy areas during the tick season, but for those whose work or pleasure involves exposure to these places, precautions may be taken to avoid tick bites.

Perhaps the first thing to be considered is, wherever possible, to improve the forests and countryside by removing the underbrush in the woodlands, and weeds and brush from open fields. In many cases fields may be burned over in the early spring and in this way many ticks may be destroyed. The cleaning up of underbrush and other types of undesirable vegetation also will play a part in the eradication of some of our rodents, such as field and woods mice, etc., which act as hosts for the immature stages of some of the ticks.

When going into tick-infested areas proper clothing should be selected which will prevent ticks from reaching and becoming attached to the skin. High boots, puttees, leggings or stockings may be worn over the trouser legs. If the ticks crawl up on the outside of one's clothing they may be seen and easily removed. Those reaching the back of the neck should be removed as soon as they are felt. It may be advisable to

feel the back of the neck occasionally for ticks when one is in a tick-infested region. Women who go into the woods should wear man's clothing as described above. However, if one goes into areas known or suspected to be infested by ticks without taking precautions to dress properly, a thorough examination of clothing and body for ticks should be made immediately upon arriving home. The hair also should be combed to search for ticks. If such precautions are taken, these parasites can be removed before they become attached to the skin and introduce infectious agents.

When ticks have become attached, which does not as a rule take place in the case of man for several hours, they should be removed with a pair of tweezers or by the fingers and a piece of paper. They always should be destroyed by burning or immersion in an oily substance or other material destructive to them.

Specific treatments for tick-borne diseases are not available at present, but the U. S. Public Health Service has developed a vaccine which has definite protective value against spotted fever. Persons vaccinated with it develop a marked immunity which affords protection against mild strains of spotted fever but is less effective against virulent ones, although it has reduced the case mortality quite perceptibly. This vaccine in all probability can be obtained by those who find it necessary to expose themselves to infected regions.

Dogs that frequent infested areas likewise should be examined for the presence of ticks. In the case of heavy infestation, these parasites may be removed by methods similar to those used on man, or the animals may be treated with various remedies lethal to ticks.

Wood Use in Adams Co.

(Continued from Page 2)

size. All posts are hauled green. Sixty posts may weigh as much as four tons and even 35 to 40 of the larger ones make that weight. The posts are purchased by the highway or for the highway work on specific bids for certain amounts. Owing to the weight it is most important that the bidder know where the posts are to be delivered.

Of those in Adams county seven pulpwood operators have been interviewed. Some of these men are farmers and timberland owners cutting during spare time or slack seasons. They may help in the cutting or hire the pulpwood cut piecework for around \$3.00 a cord (5 foot cord, really 1 1/4 cords) for the wood peeled and placed at the road ready for the truck. The pulpwood

operators receive from \$10.00 to \$10.50 a cord for the wood delivered to the mill yards either at Luke, Maryland or at Spring Grove, York county, Pennsylvania. In some cases the dealer collects the pulpwood of the vicinity for 50 cents a cord commission. The difference between the \$3.00 a cord quoted for cutting, peeling and placing at the road and the \$10.00 for the cord of wood delivered to the mill may be divided between the trucking costs, the stumpage value and any margin for profits.

A visit to one of the eleven lumber yards of Adams county reveals the amount of southern and western timber shipped into the county for local use. Southern cypress, yellow pine, yellow poplar, hemlock and oak are received for flooring, siding and frame material; and in greater quantity than the western woods. Redwood from California, white pine from Idaho, fir lumber and cedar shingles from Oregon and Washington and spruce from the northwoods are used in many ways. Fully three million feet of the deep southland and far western timbers are handled annually in the county retail lumber yards. This exceeds the local production of sawmill timber. Furthermore western and southern lumber in considerable quantity is sold in Adams county by nearby lumber dealers of Hanover and other railroad towns not far over the county line. A few of the present day retail prices for these lumbers may be of interest. Number 2 common or better yellow pine from Virginia and the Carolinas is a good seller at \$35.00 a thousand feet. Idaho white pine of sterling to number 1 shop select may range in cost from \$55.00 to \$120.00 a thousand feet and redwood at \$60.00 to \$120.00. The grades and prices are standardized to a large extent. One dealer stated that he took the Boston lumber journal and charged the Boston prices or quotations for western lumber and \$1.50 a thousand lower than Boston prices for southern lumber. A look at the trade journal for grades and prices of timber reminds one of the daily stock market quotations in a large city newspaper. It may surprise some to learn that frequently the western woods have each board or plank end waxed and stamped with the producers trade mark and name.

With apple, peach and cherry orchards in such abundance in Adams county the manufacturing of barrels and crates for picking and storing and shipping the fruit is a sizeable industry. Four barrel manufacturers in the county formerly made as many as 200,000 yearly. As each barrel holds $2\frac{3}{4}$ bushels, this gives an idea of the number of apples placed on foreign markets. Following the loss of chestnut in Pennsylvania the

materials for barrels came into Adams county in railroad carload lots, in shook form. This means every piece was sawed out and ready for assembling. Barrels were made of woods from South Carolina and Virginia and neighboring states. The staves were of poplar and gum; the heads of southern pine; and the hoops of elm. The $2\frac{3}{4}$ bushel barrels cost about 50 cents each.

Due to shifting conditions, more especially the poor export markets, the manufacturing and the use of apple barrels has almost ceased. One bushel storage and shipping crates and baskets have replaced the barrels. This has afforded a ready market for Adams county timber. The six crate manufacturing plants in the county consume nearly a million feet each year of local woods. Yellow poplar and hickory are used for side slats and maple, butternut, sycamore or buttonwood, wild cherry and elm for corner posts. The local sawmill men are paid \$20.00 a thousand feet for plank material. The crate factories rip the plank into slats. The plank are of $2\frac{3}{4}$ or $3\frac{1}{2}$ inch in thickness for slats and $1\frac{3}{4}$ or $4\frac{1}{4}$ inch in thickness for corner posts. Three of the largest crate manufacturers have their own sawmills to cut the logs into planks as needed. This cut is not listed above under sawmills. Most of the crates are made of newly sawed woods. There is no re-use of shipping crate, rather the new and clean crates help sell the apples. Western and New England white pine too is purchased in shook form. The manufacturers receive more or less standard prices of 16 to 25 cents for bushel crates. The field crates being of heavier and sturdier material cost most.

Five furniture and cabinet plants in Adams county use millions of feet of lumber each year. Little of this is home grown timber. One manufacturer said that the ease of obtaining dry woods in quantity and grades overbalanced any advantage in prices for local lumber. Southern woods used include red gum, tupelo and tulip poplar in $\frac{1}{8}$ inch to $\frac{3}{16}$ inch thickness, costing \$22.00 to \$25.00 a thousand feet delivered at the plant. Western spruce and fir and plywoods, northern black cherry, maple and black birch and South American mahogany and local or Virginian black walnut and oaks all have their place in the industry. Interesting prices mentioned for mahogany were \$135.00 to \$190.00 a thousand and on up to \$1.00 a foot for the finest of seasoned and colored wood. Adams county timbers make up approximately one per cent of the lumber used in these factories.

This county is in and near the rich and fertile farms of York and Lancaster that grow tobacco, hence manufacturing cigar boxes is a staple



Photo from Soil Conservation Service
Morse brothers mill, showing sawed products. This mill has been in continuous operation for 100 years.

trade. Four cigar box companies on the eastern edge of Adams county buy $\frac{3}{16}$ inch to $\frac{1}{8}$ inch thick woods of poplar, tupelo, spruce and plywoods in millions of feet yearly. This timber comes from the south or far west. Many boxes are now being made of paper or imitation wood, since the paper is made of wood, the forest industry as a whole is no loser in this shift.

The public utility companies, electric, telephone and pipelines, and the railroads and state highways are tremendous buyers of forest products. The three railroads in Adams county use local timber for ties. Changing times cause the more porous woods such as pin oak that absorb creosote readily, to be almost as salable as the former highly prized white oak for ties. With the loss of our native chestnut, yellow pine from the south is bought for poles, while fir cross arms are most common. One concern places 400 new electric poles in Adams county each year. The state highway purchases locust poles for guard rail construction, oak for bridge flooring and frame, and other wood for snow fences.

Practically all the berry baskets, the one quart common variety, along with shipping crates for berry baskets and fruit baskets are shipped into Adams county by out of state dealers. When you purchase a quart of strawberries remember that the local farmer who grew the berries may have paid $\frac{1}{2}$ cent or more for the box.

The rock oak bark goes to the tannery by truck

to Williamsport, Maryland, at a price of \$9.00 a ton; dry and delivered in the yard. Black locust of Adams county farm woodlots or forests has an out of state market at the locust pin mill in Hagerstown, Maryland. The building of wagon and truck bodies has almost ceased in Adams county; the main builder no longer wishing to be listed. Roadside signs use much less wood due to the metal and glass substitutes. Yet one concern buys 20 thousand feet of surfaced and finished boards and frame material each year for new signs for the county territory.

No account of the wood using industries and trades of Adams county is complete without mention being made of the local woods; white and red oak, hickory, yellow poplar, ash, maples and hickory poplar for low priced homemade rocking chairs and stools; of the osage orange placed in beautiful and sturdy bows rivaling the useful Indian bows for strength and durability; and of the red cedar for novelties and souvenirs.

A wood utilization survey of necessity is conducted more or less by inquiring from place to place. There appears to be no complete record available of the wood using and lumber producing concerns. The Eighth Industrial Directory of Pennsylvania lists two sawmill operators for Adams county. By dint of observation and questioning a total of 37 sawmills was found. A canvass such as the one indicated in brief form above depends on the cooperation of the people.

Tree Therapeutics

H. G. MATTOON

THE science of medicine recognized many years ago the necessity for effective therapeutic measures if the human race is to be reasonably free from disease. Intensive medical research has provided this therapeutic information and the boon to mankind is beyond counting. American trees have not yet had the benefit of such therapeutic research and therefore once stricken with internal disease, human assistance is of little value.

Recently, a committee of the National Shade Tree Conference of which Dr. E. G. Rex is chairman proposed a program of research in tree therapeutics as the basis for intelligent care by foresters, tree wardens, park managers and others, of all shade and ornamental trees. Tree therapeutics to be successfully employed must be fortified with concrete facts pertaining to:

1. The nutritional needs of the shade tree species for full attainment of vigor.
2. Antiseptic chemicals compatible with normal tree physiology that will inhibit or kill established parasites.
3. Practical and effective methods of administering to trees for malnutrition and disease control.

Shade trees and to a less extent forest trees today are being attacked by a multitude of diseases and insects of foreign origin. While in some cases these attacks do not result in the death of the tree, they retard growth or spoil its appearance. The number of diseases which cause this alarming disruption of our shade tree life is too great to discuss here, but I should like to mention a few.

The American elm, the prize tree for ornament and shade purposes in many sections of the country, is subject to an unusual number of serious enemies, particularly Dutch elm disease, Cephalosporium or wilt and Phloem necrosis, sometimes called Ohio elm virus. The last named disease alone has destroyed 1200 of the 1800 elm trees in Chillicothe, Ohio, in the last three years. The number of elms killed by Dutch elm disease in the last six years is over 50,000. No count has been made of the trees that have died because of attack by wilt.

The plane tree, more commonly called the sycamore, is succumbing in increasing numbers

to the London plane disease, which is now prevalent in Newark and Camden, New Jersey, Philadelphia, Baltimore, and Washington.

The maple trees of the eastern part of the country, particularly the Norway maple and the sugar maple, appear to be increasingly affected by a fungus which causes wilting and death.

At the present time, comparatively little definite information is available on which the plans of tree therapeutics can be based. From time to time, an occasional scientist has dared to assume that it is possible to kill or retard the growth of a fungus in a tree by internal treatment. A few have pursued the problem until the complexity of the chemicals involved forced them to surrender. Knowledge of wetting agents and antiseptic chemicals was meager in the past compared with that known today. The most appealing phase of disease control by tree therapeutics is that a chemical may be discovered that will serve as a specific for more than one disease. Such a discovery would subordinate the tedious and less remunerative investigations of biology of each parasite, the host-parasite relationship, etc. Research on the subject of disease and insect control by feeding or injection may open an expanse of practical application beyond comprehension today.

The proposal is that intensive research on the subject of tree therapeutics be conducted by the United States Department of Agriculture, Bureau of Plant Industry, Division of Forest Pathology with the following technical personnel:

- One full-time forest pathologist,
- One full-time plant physiologist,
- One full-time biochemist,
- One consulting forest entomologist,
- One consulting soil technologist.

In addition, of course, it will be necessary to provide assistants, facilities and supplies. An appropriation of \$50,000 for the fiscal year of 1942 is requested.

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1. The adequate protection of all Pennsylvania forests from Fire, Fungi, and Insects.
2. The personnel of the Department of Forests and Waters to be chosen and retained on a basis of efficient service only, in order to guarantee permanency of policy and continuity of action.
3. The management of the State forests so that they may supply the permanent needs of the people not only for continuous timber protection but also for recreation, hunting and fishing.
4. Greater co-operation between the departments of the State Government for protection of the beauty of the public lands.
5. Adequate biennial appropriations for the purchase, protection, and development of the State forests.
6. The education of the public, corporations, sportsmen, and forest land owners with respect to the value of our forests and the necessity for their development and proper utilization.
7. The planting of trees and other useful vegetation on waste and idle lands and the continued distribution of seedlings by the State.
8. The education of our children in forestry in both public and private schools. A love and appreciation of the forests tend to a better type of citizenship.
9. The establishment of town and county forests which will bring pure air, pure water, and recreation close to the centers of population.
10. The preservation of the few remaining areas of virgin timber in Pennsylvania.

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Organized in 1886

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THE PENNSYLVANIA FORESTRY ASSOCIATION

Founded in June, 1886

Labors to disseminate information in regard to the necessity and methods of forest culture and preservation, and to secure the enactment and enforcement of proper forest protective laws, both State and National.

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Whole Number 300

The Decline of State Forestry in Penna.

By H. GLEASON MATTOON

WITH increasing frequency the thought is being expressed that the enthusiasm for forestry in Pennsylvania has died during the last eight or ten years; that the reputation this State has for conserving and managing its woodland resources derives from past activities rather than present practices and that the Department of Forests and Waters by its narrow, vacillating policy has contributed largely to this lack of interest. Since this is a severe indictment, let us look at the record.

It is the duty of the Department of Forests and Waters to manage, protect, utilize and develop the lands and resources of the State forests. The Department likewise is empowered to protect forests from fire, fungi, and insects, to promote knowledge of forestry, to publish information respecting forestry, to distribute tree planting stock and advise and assist landowners in tree planting.

To carry out the purposes of these acts, the State has been divided into twenty-four districts, each of which is in charge of a district forester with assistants, inspectors, and fire wardens. In all there are 43 foresters in the Department, 83 inspectors, and 3900 fire wardens. In addition, between 30,000 and 40,000 persons in the State are members of fire crews, whose duty it is to be prepared to fight forest fires under the direction of the wardens.

The appropriations for the Department of Forests and Waters for all forestry purposes have varied little from one fiscal biennium to another during recent years. They have been as follows:

1933-35 biennium	\$1,705,000
1935-37 "	1,672,500
1937-39 "	1,798,500
1939-41 "	1,668,500

Governor James called back \$119,000 of the last appropriation, making it actually \$1,549,500.

In each of the past two fiscal bienniums, the appropriation for fire extinction has been cut from \$200,000 to \$150,000. Notwithstanding this reduction, the Chief Forest Fire Warden has done a notable job in keeping down the area burned per fire. In 1934, the average area burned per fire was 42.9 acres; in 1935, 20.8 acres. While there has been some fluctuation, the trend has been down. In 1939, the average was 15.1 acres and so far this year 14.6 acres. We can not then accept the indictment in toto, since the Bureau of Protection has continued to function well notwithstanding the difficulties of the job.

We must, also, give credit to the Bureau of Parks for the development and improvement of forest recreation in the State. Eighty-eight historical parks, recreational areas and natural monuments, administered by this Bureau, were used last year by 5,900,000 persons. This attests both to the need and popularity of forest recreation. Continued expansion of the recreational facilities is recommended, having in mind that most of the present areas are remote from the large centers of population.

Seedling Distribution

The production and distribution of forest tree seedlings and transplants has likewise been an efficiently managed activity. In 1939, 13,430,800 trees were grown and distributed by the four nurseries maintained by the Department. Of these 2,254,300 were planted on public lands and 11,176,500 trees were used for reforestation by private land owners. While these figures seem large, translated into acres reforested they are pitifully small. If the rate of replanting

does not change, 140 years will be required to reclothe the acreage now cut-over, burned-over and in scrub growth, not to mention areas that will be desolated in the future by clear-cutting and fire.

Nearly every year many orders for trees are received by the Department that can not be filled. Since the private landowner is anxious to reforest his denuded and wasted land, criticism can be levelled at the Department of Forests and Waters for not stepping up the production of seedlings to meet the demand.

No Management of State Forests

Even though several thousand acres have been in state forests for as long as forty years, no management plan has ever been developed and put into force. In recent years the excuse for delayed adoption of a system of management has been that the stock survey has not been completed. While such a survey will unquestionably, aid in working out a wise plan, it seems incredible that 1,650,000 acres of forest land, the amount under the jurisdiction of the Department, should be held and administered year after year in a haphazard manner. This is particularly regrettable since these forests were to be the examples that private land owners might follow in managing their forest lands. Though lumbering will never again be the chief industry of Pennsylvania, had a management policy been pursued, thereby demonstrating to private forest owners the wisdom of such a policy, we might not have to import over 70% of the wood we consume nor would there be as many ghost towns and starving communities with much of their population on relief rolls.

The Department can and should be severely criticized for neglect of this, one of the most important of its activities.

No Marketing Information

Recently, I received a letter from the owner of 700 acres of forest land of which the following is an excerpt: "Part of this 700 acres is natural mixed forest. Part has been replanted in pine over the past 15 years. Consequently, we own some mature timber and some which will soon require thinning. The planting was done under the direction of the state forestry department.

"We are desirous of developing a program of lumbering which shall work toward a sustained yield, proper forestry development, and taking advantage of local markets and needs. We are afraid that if we consult lumbermen we shall not get the forestry angle. On the other hand, the Department of Forestry men do not know much about markets."

This is typical of several letters I have received during the past year. It almost duplicates, also, statements that have been made to me verbally by forest and woodlot owners. There is a general belief in Pennsylvania that the employees of the Department of Forests and Waters do not know or are not interested in the marketing of the wood products that are grown in the forests of the State. Conservation is not preservation; it is the wise use of the natural renewable resources. If the Department is not going to advise in the use of the products grown on forest lands, forestry in the state might better be forgotten because it will be impossible to get private land owners to protect their woodlands, do proper thinning or establish a management plan if there is to be no market for the result of their efforts.

No doubt many of the foresters in the Department are equipped by training and experience to give advice in proper cutting and marketing. The fault lies in an inadequate organization and a disinclination by the Department to grasp its responsibilities. It is stupid to preach planting and protection and do nothing about utilization. Forestry in Pennsylvania will rise or fall depending upon whether the Department is prepared to furnish marketing information and is willing to devote time and money to develop or uncover wood uses that will make closer utilization possible.

Utilization

The Department of Commerce has been working diligently to bring industries into Pennsylvania to reduce unemployment, raise the standard of living, and increase the state revenue. These efforts have produced results, principally in the larger centers of population. At the same time, towns in the central part of the State surrounded by state forest lands are dwindling and dying.

Why shouldn't there be cooperative action by the Department of Forests and Waters and Department of Commerce to bring small wood manufacturing industries into these towns? The annual growth on some state forests is ample to supply a small industry. In places where it is not, additional raw material can very likely be obtained from nearby private lands. The kind and number of industries that can be supported will have to be studied, but it is important to check the progressing abandonment of these towns by migration to the cities. The economic condition of many rural people is almost entirely dependent upon the management of the state forests.

(Continued on Page 12)

How Switzerland Cultivates Her Forests

By MARIE WIDMER

SWITZERLAND, in the year 100 A. D., is described as being covered with swamps and great impenetrable forests and the latter offered indeed tremendous obstacles to colonization. The necessary land for pastures and agriculture had thus to be taken away from the forests and the history of the colonization is consequently closely connected with that of the forests.

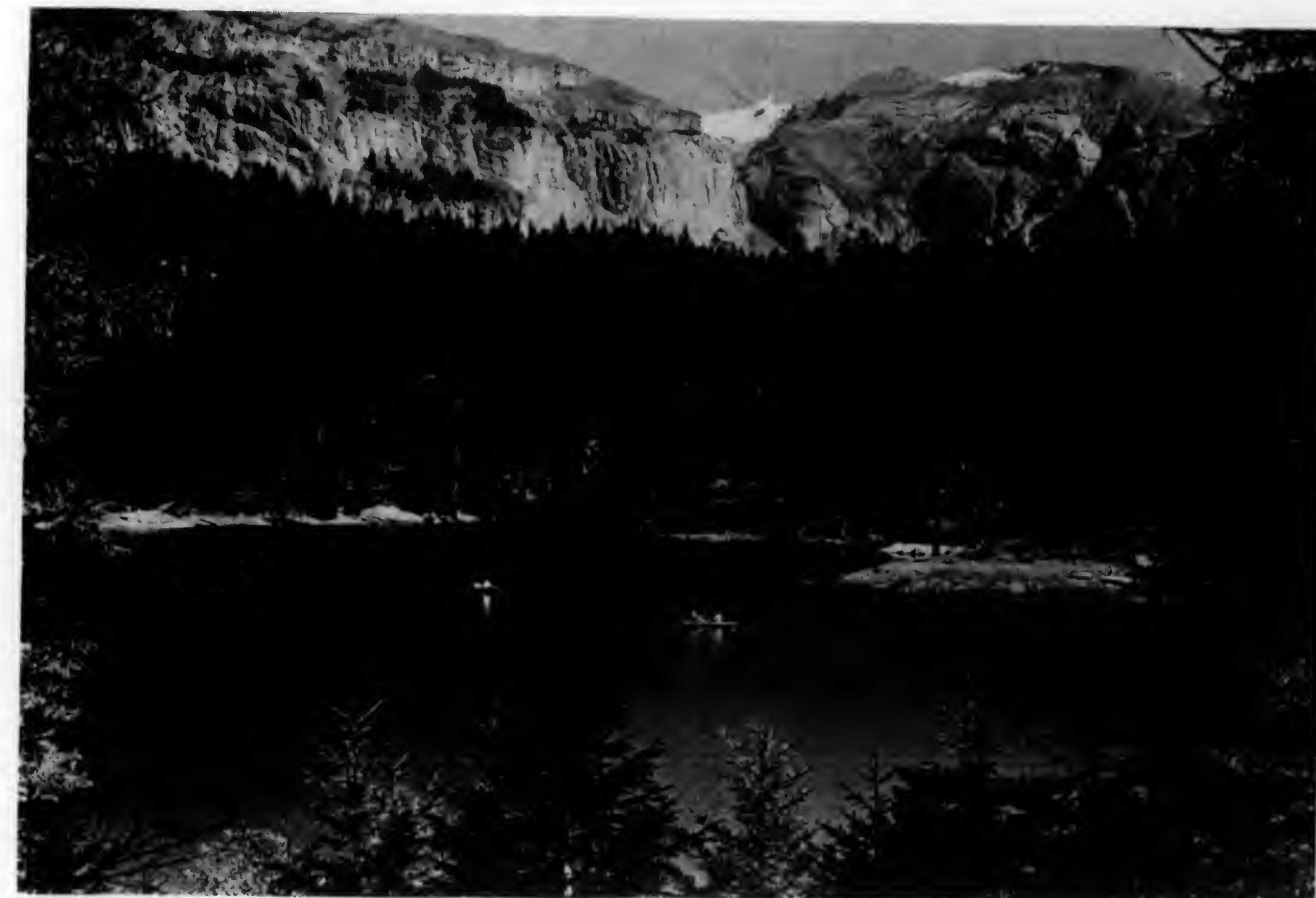
Not much attention was paid to the cultivation or preservation of the forests in those early days when the Alemanni, Burgundians and Franks swept through the land, but in the time of the latter, when Charlemagne was king, a general and remarkable improvement of the conditions took place. History relates that Charlemagne's grandson presented in the year 853 A. D. the now famous Sihl Forest of Zürich to the Convent of Fraumünster in that city, which indicates

that the Sihl Forest is actually one of the oldest cultivated forests in Switzerland.

Gradually, as settlers began to scatter all over the country, their attention was drawn to the forestry problem and it is shown that in the 13th century there were already a number of villages which had prohibited the cutting down of certain forests, as the same provided protection against the ever threatening peril from the avalanches. Thus we find Altdorf and Andermatt in the Gottard route each with their "Bannwald." For some time the great vaudoise forest of Risoux in the Joux valley was also considered as a "protecting forest," as its presence could facilitate the defense of the frontier towards France, in a case of emergency.

However, only in the 18th century was there

(Continued on Page 14)



Pine-fringed Cauma Lake in the Grisons, Switzerland, a popular rendezvous for lovers of water sports.

Photo Jules Geiger.

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SEPTEMBER-OCTOBER, 1940

FORESTRY SUPPER AT CRESSBROOK FARM

TWO hundred forty-one persons met for supper at Cressbrook Farm, Valley Forge, on the evening of September 17. This meeting, sponsored by The Pennsylvania Forestry Association, the Allegheny Section of the Society of American Foresters, and Mr. Henry N. Woolman, was especially planned to give foresters, conservationists and nature lovers in Pennsylvania and nearby states an opportunity to meet and talk with the visiting scientists, who took part in the round-table conferences on, "Some Fundamental Aspects of the Problem of Conservation of Renewable Natural Resources," held at the University of Pennsylvania as part of the Bicentennial Celebration.

Cressbrook Farm, formerly the property of Mr. Woolman, is now owned by the University of Pennsylvania through his generosity. The house, which was built in 1736 and used as one of the staff headquarters during the winter the Continental Army spent at Valley Forge, was tastefully decorated for the occasion by Mrs. Henry N. Woolman, Jr.

Among those present were Dr. Wilbur K. Thomas, President of the Pennsylvania Forestry Association, and Mrs. Thomas; Dr. H. L. Shantz, of the U. S. Forest Service, and Mrs. Shantz; Dr. Samuel T. Dana, Dean of the School of For-

estry and Conservation, University of Michigan, and Mrs. Dana; Dr. Raphael Zon, Director of the Lake States Experiment Station, and Mrs. Zon; Dr. Gustav A. Pearson, Fort Valley Experiment Station, Flagstaff, Arizona; Dr. Ellsworth Huntingdon, Yale University; and Dr. Paul B. Sears, Professor of Botany, Oberlin College.

Professor William S. Cooper, University of Minnesota; Mr. and Mrs. Julian F. McGowin, Chapman, Alabama; Dr. Charles G. Abbot, Secretary of the Smithsonian Institution, Washington, D. C.; Dr. A. E. Douglass, Director Emeritus of the Stewart Observatory, University of Arizona; Dr. and Mrs. John M. Fogg, Jenkintown; Dr. William Seifriz, University of Pennsylvania; Dr. Frank E. Williams, University of Pennsylvania; Dr. and Mrs. David Robb, Merion; Dr. Hardy L. Shirley, Director of the Allegheny Forest Experiment Station, and Mrs. Shirley; Dr. J. R. Schramm, Professor of Botany, University of Pennsylvania, and Mrs. Schramm; Dr. James F. Bogardus, Former Secretary of the Department of Forests and Waters; Professor Victor Beede, Head of the School of Forestry, Pennsylvania State College, and Mrs. Beede; Former Senator and Mrs. George Wharton Pepper; State Senator and Mrs. George Woodward; and Mr. and Mrs. Francis R. Strawbridge.

Also present were several members of the Pennsylvania Department of Forests and Waters, the Department of Forestry of Delaware, and the Department of Conservation and Development of New Jersey. The Horse Shoe Trail Club, the Garden Club Federation of Pennsylvania, the Pennsylvania Community Forest Council, and the Society of American Foresters were also well represented.

Being entirely informal and without a prepared program, it was an innovation. No speeches were planned or given, principally because it would have been impossible for a speaker to see or be heard by all present. Due to the fact that reservations greatly exceeded expectations, it was necessary to erect a marquee on the lawn outside the dining room to accommodate the overflow.

Undoubtedly, this was the most interesting and well-attended meeting the Association has had in many years. Several persons at the meeting, alert always to the possibility of wise use of all land, expressed the thought that on the 600 acres of Cressbrook Farm, the Botany Department of the University of Pennsylvania should have an opportunity to start one or more projects related to conservation. Among those suggested were tree crop culture, a University of Pennsylvania forest, and erosion control.

Bushy Run Battlefield State Park

By V. M. BEARER

THE English established homes in cleared patches in the New World, and Pontiac, Chief of the Six Nations, Sachem of the Ottawas, felt this kind of progress would, in time, mean the loss of the hunting grounds of the forefathers and ultimately the extinction of his race. Braddock's defeat a few years before served to increase the contempt of his people for the English.

Pontiac had his warriors visit all tribes between the "Upper Lakes," the Mississippi and Ohio Rivers, planning a concerted attack on the English. A bundle of sticks was left with each tribe, each bundle containing as many sticks as there were days remaining to make the general attack. Historian Francis Parkman says this is "The only approach in all history of any unity of action on the part of all Indian Tribes." This timing of the attack proved satisfactory with the exception of the tribe which was designated to attack Fort Pitt. Here, for some reason unknown,

a Delaware Indian squaw removed three of the rods from the bundles.

The attack was successful and nine forts fell. However, Forts Detroit, Niagara, Pitt, Ligonier and Bedford were successfully defended by the English. Many refugees wandered into Carlisle for protection. On August 2, 1763, Colonel Henry Bouquet, with a small number of troops arrived at Fort Ligonier on his way to relieve Fort Pitt which was now besieged by the redskins. Communication between these two posts had been rendered impossible for some time and there was fear that the Fort might fall to the Indians.

Three days later, Bouquet and his small army set out for Fort Pitt hoping to get as far as Bushy Run that day.

About noon the rifles of the advanced scouts were heard, war-whoops sounded and Indians came rushing in from all sides. The Battle of Bushy Run was on. While Colonel Bouquet



Delaware Indian Big House at Bushy Run Battlefield Park.

each time broke up the attacks and drove the savages back, this availed him nothing for the redskins would soon reappear in continuously increasing numbers. After dark the Indians withdrew, only to attack more fiercely at dawn the following day. In order that he might draw the Indians into the open, Colonel Bouquet, now seriously threatened with defeat and massacre, with the Indian attacks growing more fierce and their war-whoops growing louder, feinted a retreat. He withdrew many of his men, who descended down over a steep cliff (Edge Hill) where they were beyond sight of the enemy. This bit of strategy worked and turned threatening defeat into victory. The Indians dashed wildly out into the open, assailing the weakened lines of the defenders. When victory seemed within their clutch, the companies came out from behind the hill, firing directly into their flanks. Many of the redskins were killed and the others dispersed. In this engagement, Bouquet lost 115 officers and men, as well as most of his supplies which he hoped to get to Fort Pitt. Because he threw up bags of flour to protect his wounded and supplies, this battle site has been referred to as the Flour Bag Fort. A monument now stands in the midst of what is Bushy Run Battlefield State Park, marking the site of Flour Bag Fort. The victory at Bushy Run discouraged the Indians from further siege of Fort Pitt, thereby opening the "Gateway to the West" to the English.

This Park of 132 acres includes much of historical interest. On the grounds have been constructed a replica of the Delaware Indian Big House, inside of which will be found replicas of sacred fire altars, ceremonial drums and drum sticks, sacred prayer sticks, turtle shell rattles, and other articles used in the Indian Big House ceremony. To the Delaware tongue, "Big House" means the universe and its center post (without which no big house would be complete) is the staff of the "Great Spirit." The carved-face images on this staff may be referred to as symbols of the Supreme Power. WPA artists have designed cards and plates showing the way of the "White Path" which is the symbol of life's progress.

The "Big House" ceremony was a sacred ceremony which continued for twelve days and twelve nights. The ceremony proceeded from east to west (from the rising sun to the setting sun) symbolizing that life begins in the east and ends in the west. This is the "Path of life down where man wends his way to the western door where all ends," (by Frank G. Speck, Pennsylvania Historical Commission).

The "Milky Way" is the path which the soul follows after death.

A year or two ago, a replica of a pre-historic Indian Palisade, evidence of which was unearthed in Somerset County, was constructed. A survey was made showing the exact location of material used in the construction of the original palisade as evidenced by soil disturbances which are clearly seen. This palisade has been reconstructed from that survey. Parts of skeletons discovered in that palisade were on exhibit at Bushy Run for a short time last year. In accordance with Indian traditions, the "Big House" was oriented with one end facing the rising sun and the other, the setting sun.

The old Byerly Spring House in the park has been converted into a temporary museum to house many of the relics of pioneer days. It includes hundreds of arrow heads, tomahawks, Indian beads, old guns, rifle balls and other articles. Most of these relics, including a large bayonet, were unearthed at the Flour Bag Fort site.

Many Indian relics which have been offered for display, have been refused because of lack of space and the absence of a fire-proof structure, which is sorely needed.

Bushy Run Battlefield Park had its inception as a park in 1918, when six and one-half acres of the battlefield were purchased by the Bushy Run Memorial Association. Penny subscriptions from 70,000 children of Westmoreland County's public and parochial schools netted \$726.00, with which the purchase was made. The Association soon added thirteen acres to this modest beginning while in 1927 the Pennsylvania Legislature appropriated \$25,000.00 to purchase more land, to mark and develop this important battlefield site.

Both dogwoods and crab apples abound in the southern section of the park. Their early spring blooming marks the seasonal "opening" of Bushy Run.

290,000 people visited the park this year, up to September 15th. Vehicles checked at the park numbered nearly 50,000. Visitors to Museum: 11,500. Visitors to Big House: 7,500.

For recreation and picnics there are four public camps, namely, Seneca, Mingo, Ottawa and Iroquois, each camp consisting of sheltered and open tables, stone fireplaces, shelter pavilions, parking lots, swings, sandboxes and horseshoe pitching alleys.

For nature study there are five miles of marked nature trails.

Tree Rings Tell Interesting Stories

By DR. EDWARD E. WILDMAN, Consultant

Executive Staff American Philosophical Society's Committee on Education and Participation in Science

CLIMATOLOGISTS are interested in trying to reconstruct the story of the weather of the past. In itself this story is of interest to the amateur, but to the engineer responsible for planning highways, railways, bridges and dams, to the navigator and the aviator, the story contains information that is essential for success.

Tree rings tell this story. In our southwest, Dr. A. E. Douglass and his associates have used the weather record of the tree rings to date the buildings erected there by the cliff dwellers and other prehistoric peoples. In the mid-Atlantic States we have no such ancient buildings to date, but we are interested in the tree ring history of our weather—stories of droughts, floods and hurricanes, dropped suddenly here and there into the long narrative of peaceful, good growing years for our oldest trees.

The search for our weather history in the tree rings is one in which amateurs can take part and make observations of great value. Our National Weather Bureau began making and publishing official records in 1872. Each monthly report bears a summary of mean temperatures and rainfall for each month back to that date. With this record before us, each freshly cut tree section becomes a challenge to interesting tree ring study. We can look to see what correlations can be found over the past seventy years, for dry years will be marked by narrow rings and wet years by wide ones.

In the middle 1930's we had a series of dry years, not only in our region but throughout the country. That period will be marked in all of our hillside trees by a band of thin rings, no matter what their species, or normal rate of growth. Such bands can be recognized easily, and when found in many specimens over a wide area are called "signatures" by the tree ring specialists.

The signature becomes all the more reliable as an identifying mark in widely scattered specimens if it is made of both thin and thicker rings always occurring in the same order. The best signatures are to be found in trees which grow on well drained ground, not near constant water supplies. Such trees are known as sensitive trees because their rings indicate yearly differences in rainfall accurately.

* Printed with permission of Science Service.

By using the signatures left by sensitive trees, students in this field in our southwest have found the weather record of each year back to 180 B. C. Our more moist climate in the eastern states probably precludes the hope of such distant dates here, and yet, the study of sections of submerged cedar logs in the bogs of southern New Jersey might reveal a record equally long. For practical purposes, however, the amateur in this field has ample material for study. We have many trees in our section which are not less than 200 years old. Storm damage requires the cut-



Dr. Wildman, vice president of the P. F. A., studies some tree rings.

ting of one of these old monarchs occasionally and its rings, of the tree grew on well drained ground, tell a story of the greatest interest and value. Since the date of cutting is known, each ring, clear in to the center, can be dated. Correlation with the official weather reports can be checked back to 1872 but prior to that date the rings must tell the story themselves. Their story is supported here and there, however, by scattered unofficial weather notes which appear in interesting old diaries and letters still to be found in the archives of some of our families and libraries. Such daily records were kept at the Pennsylvania Hospital in Philadelphia through the closing decades of the eighteenth century and early nineteenth century.

Charles Pierce, a diarist of Bristol, Pa., recorded that freezing weather occurred in every month of the year 1816. Unofficial accounts of serious droughts, floods, and wind storms are scattered through the lore of the Delaware Valley since its settlement, nearly three hundred years ago. We must go to the tree rings for verification of these records.

It was to check such facts and to stimulate an understanding of science, through actual participation on the part of men and women in everyday walk of life, that an unusual experiment has been conducted within thirty miles of Philadelphia since last April. Through its Committee on Education and Participation in Science, composed of a group of eminent research scientists, the American Philosophical Society has sponsored a volunteer project for the study of tree rings in relation to local climate. Over 100 persons have already contributed information concerning ancient trees and their cross-sections. These persons lived in 64 different cities, towns, or on farms scattered up and down the Delaware Valley in parts of Delaware, Maryland, Pennsylvania and New Jersey. They are farmers, housewives, teachers, engineers, businessmen and persons representing many professions and trades. All of them are getting enjoyment while following a scientific hobby and contributing to research.

There is no reason why individuals and groups in other communities throughout the country might not make local studies of a similar nature if scientists or others could be found as sponsors. Such amateurs can carry out the search for the story of the tree rings in two ways. First, they can make careful sections of sensitive trees as opportunity offers and date and measure the rings themselves. These values should be plotted on a curve or chart after being reduced to common units so that signatures can be recog-

nized readily and all records easily compared. Such charts would be labeled fully and sent to a center for study where many such records can be compared.

The second method of recording tree ring story does not require handling the tree section. We make a paper record of the rings directly. Across the cut and smooth surface of the stump or log lay a piece of adding machine paper from bark to bark and thumb tack it down so that it will be held firmly in place. Then a red pencil may be rubbed carefully along the strip down the middle about one inch wide. The rings will show up beautifully. In this way, the tree ring story is transferred to paper without error and the record may be kept indefinitely.

Thus, we can get the tree ring story from recently cut trees. But by the study of the cut ends of timbers taken from our older houses, barns and mills we may be able to carry the story back many years farther. The study of timbers requires well marked signatures which can be found in tree sections of known age and also in the timbers studied. The whole significance of tree ring study was interestingly reviewed in an article "History as The Tree Rings Tell It," by Florence M. Hawley in *Readers Digest* for March 1940, reprinted from the magazine, *American Forests*.

If anyone wishes to secure further information on the amateur tree ring study as carried out by the American Philosophical Society's Committee, he should write to W. Stephen Thomas, 104 S. 5th Street, Philadelphia, Pa.

BACK NUMBERS OF FOREST LEAVES AVAILABLE

A member of The Pennsylvania Forestry Association has kindly offered to make available without charge a long list of early issues of FOREST LEAVES. It may be that some organization or individual may wish to have a complete set of FOREST LEAVES and will find this offer of interest.

The issues available are complete from the founding of the Association in 1886 through 1915 with the exception of the February and June issues in 1888, the July issue of 1892, the February, April and June issues of 1893, October 1911 and August 1912.

Anyone wishing these back issues should write to The Pennsylvania Forestry Association, 1007 Commercial Trust Building, Philadelphia, specifying the numbers desired and we will see that they are delivered to him.

FOREST LEAVES

The Development of Memorial School Forests

By STANLEY MESAVAGE, Forester,
Wyoming Valley Chamber of Commerce

THE development of Memorial School Forests as small community forests throughout Wyoming Valley will aid the local communities in forest conservation from an educational point of view in considerably reducing and possibly eliminating the fire problem that now menaces our fields and forests annually. School children can be taught to plant, grow and protect the forests, and in this way prevent rather than start fires. Small contributions of only three cents from the children will make possible the purchasing of several thousand trees from the State Department of Forests and Waters. As stockholders and planters they will not only protect THEIR growing forest from fire and trespass, but the surrounding forests as well.

METHODS OF ACQUIRING THE LAND—Surface lands for school forests can be secured by (1) direct purchase (2) 20-year lease, or (3) land-use agreement. If the surface lands cannot be purchased outright, a lease for a period of 20 years will suffice. However, if this cannot be done, a land-use agreement can be easily arranged permitting the school children to plant the trees and thereby establish the forest. Since the landowner is bound by an agreement to protect the trees until maturity, the school children will benefit in the meantime.

PURCHASING OF TREES—Forest tree seedlings, one to three years of age, can be purchased from the Pennsylvania Department of Forests and Waters at \$2.00 per M. A small cost for shipping is charged. Seedlings vary in height from 5" to 18". The following may be secured: Norway spruce, white spruce, Banks pine, pitch pine, Scotch pine, white pine, red pine, Japanese larch, black locust, red oak, chestnut oak, hemlock, and black walnut. Application forms can be secured from the Department at Harrisburg. The trees are shipped C. O. D.

METHODS OF FINANCING THE COST OF TREES—The best method of introducing the development of school forests is to request a small contribution of \$.03 from each student in the school. Usually enough money can be collected to buy

from one to five thousand trees. In this manner the children, as stockholders, will take a greater interest in the forest and will protect their stock. The second year, the school board may purchase the same amount at a very low price. The third year, service clubs may be called upon to buy the trees and finally, the landowner himself.

SELECTION OF THE SITE—The location of the site for the school forest should be as close to the school as possible. The land must not be assessed at more than \$100.00 per acre. An agreement between the landowner and the school board can be arranged without difficulty. The State application for the trees as signed by the landowner is usually sufficient to make the agreement binding.

A forester should be called on to examine the site and to recommend the proper species for planting. Hazards encountered should be cleaned up and the area prepared for planting.

FOREST TREE PLANTING—After the trees have arrived, arrangements should be made to heel them in the ground as instructed on the package. Planting plans are always enclosed with each shipment. A state forester should be called upon to arrange for Arbor Day exercises, and tree planting. Before planting it is most advisable to organize the older boys into crews. Sketches can be made on the school boards showing how the trees must be planted. Local State forest fire wardens are always glad to cooperate on projects of this sort. Boy Scout troops and Scout leaders likewise accept such civic projects as part of their program.

Successful Memorial School Forests have been located at Glen Lyon, Wanamie, Stearns, Alden and Nanticoke, on properties of the Susquehanna Collieries Company and the Glen Alden Coal Company under agreement with the Pennsylvania Department of Forests and Waters.

Louisiana annually produces more mink pelts than any other state of the Union. With the exception of the otter the mink is the most valuable pelt taken in this State.

Nine

The Bag Worm

By H. GLEASON MATTOON

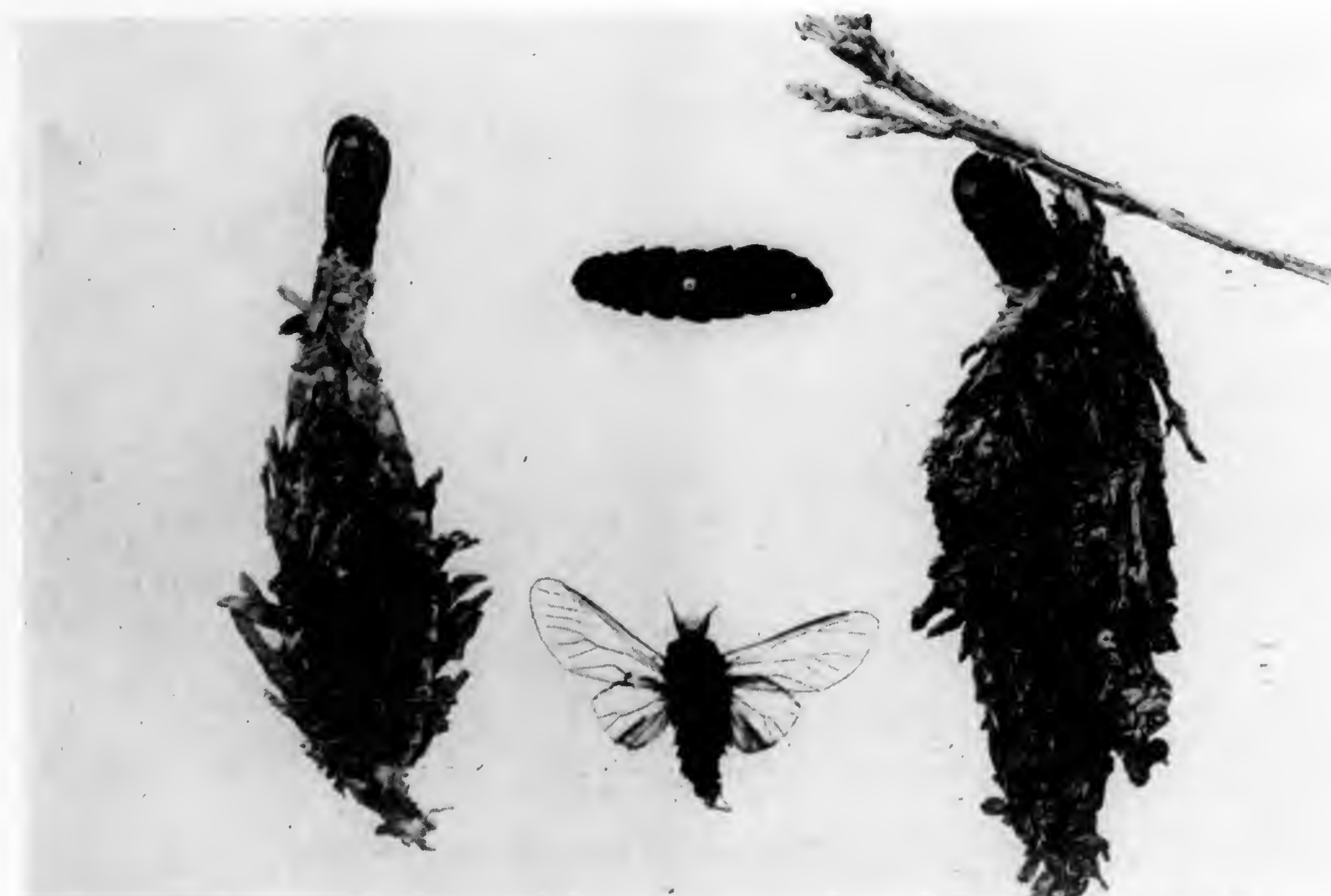
NEVER have I seen such damage from bag worm as this year. What combination of circumstances made this possible is hard to say. It may be that adverse weather conditions killed many of the parasites—tiny wasp or fly-like insects which prey on the bag worm. More likely, however, the population of hyper-parasites—(insects which destroy the parasites) had markedly increased, thereby reducing the number of the parasitic enemies of the pest.

A bag worm feeds on a variety of foliage, but does greatest damage to conifers and other evergreens, since they are less able to withstand defoliation than are deciduous trees. Although it is catholic in its taste, among ornamental plants it seems to prefer arbor vitæ, red cedar and the spruces.

The bag worm is a caterpillar which protects itself by constructing and living in a bag-like shelter during its period of feeding and growth. As the caterpillar increases in size, it

adds to the silken bag and attaches to the exterior tiny particles of leaves or bark of the tree on which it is feeding. This causes a variation in the appearance of the bag. The caterpillar feeds by devouring the foliage.

The adult of the caterpillar is a moth, the female being wingless and of a gray-white color. The male is an attractive black-winged moth with feathery antennae. The female emerges from the pupal case in October, is fertilized by the male and immediately turns around and deposits from 1,000 to 3,000 eggs inside the chrysalid from which she has emerged. She then dies. The eggs winter over in the bag and the young caterpillars hatch, in the vicinity of Philadelphia, between the 1st and 10th of June. They immediately start feeding on foliage and even when they are less than one-quarter of an inch in length construct the bag in which they remain during the growing period. Feeding continues until September.



U. S. Dept. Agr. Bur. E.P.Q.

Larva, pupa and male adult of the bag worm, *Thyridopteryx ephemeraeformis*.

Since one female bag frequently contains 2,000 or more eggs, it is easy to understand why this insect increases rapidly and defoliates the tree. Because the pieces of leaves and bark attached to the outside of the bag are not unlike the foliage of the tree it is difficult to see these insects until they have attained considerable size and have done much damage.

Spraying with arsenate of lead at the rate of three pounds to one hundred gallons of water applied by June 15th is effective in killing them. When the caterpillars grow larger it is more difficult to kill them by a poison application. If the bags are not discovered until August it is far better to pick them off by hand than to attempt to kill them by spraying. Care should be used, however, to see that every bag is removed, or the tree will be reinfested the following year. Since the caterpillars do no feeding during the winter, the removal of the bags may be deferred until winter if you so wish.

After they have been collected, they should be placed in a basket or pail with a wire cover. This will allow the parasites which may be attacking the caterpillars to mature and be released without danger of having the bag worm crawl out of the container.

Tionesta Area Formally Established

By A. F. HOUGH

THE Tionesta tract of virgin hemlock-beech timber in northwestern Pennsylvania, preservation of which was vigorously advocated by the Pennsylvania Forestry Association, was formally set aside by the U. S. Forest Service on July 31, 1940, and will be devoted permanently to scientific use and for the education and enjoyment of the public. This 4,131 acre tract, a part of the Allegheny National Forest, is located at the headwaters of Tionesta Creek about 7 miles south of Ludlow. Purchase of the area received the support of the late Chief Forester, F. A. Silcox, and was approved by the National Forest Reservation Commission in 1934.

The Tionesta Natural and Scenic Area is virtually the last and largest remnant of the virgin forests which covered 6,000,000 acres on the northern Allegheny Plateau at the time of William Penn. A few individual hemlock antedate the discovery of America by Columbus in 1492. The purchase and reservation of this forest is an important step in the program of the U. S.

Forest Service for preserving natural areas characteristic of native forest and range vegetation in all regions of the United States.

Two major obligations are recognized by the Forest Service in its administration of this area. First, to preserve the native plant and animal life in their natural state insofar as this can be done on an area of this size, and, second, to allow the public to enjoy the grandeur of the virgin forest that once covered all this high plateau region of Pennsylvania and southern New York without jeopardizing its perpetuation. For this reason the area is divided into two parts; the northern portion, consisting of 2,018 acres and designated as the Tionesta Scenic Area will be made accessible to the public by road and foot trails. Here the inspiration and true recreation to be found in a fairly large area of primeval forest may be enjoyed amid towering hemlock 300 to 500 years old and veteran beech 350 years of age. The southern portion, consisting of 2,113 acres and designated as the Tionesta Natural Area, is dedicated primarily to scientific research. This area is admirably suited for studying the development of the climax type, the natural rejuvenation that results in the perpetuation of the climax, and the response of the climax forest to climatic and biologic cycles. It is equally valuable for studying how completely the virgin forest supplies the life needs of the various animals found therein, and of how the forest with its multitude of different plant and animal forms influences the local climate, the soil, and the regimen of streams.

The Forest Service desires that full use be made of this area as a field center for research studies. Scientists desiring to conduct studies in the Natural Area are invited to get in touch with the Allegheny Forest Experiment Station.

The average price of lumber per thousand board feet at the mill has increased materially since 1899. White pine was quoted at \$14.81 a thousand, while in 1936 it was \$26.63. Oak in 1899 was \$14.62 a thousand and in 1936, \$23.05. While these last figures are almost double those of 1899, they are considerably under the peaks of 1919 and 1929. In the former year, white pine was quoted at \$37.50 a thousand and in 1929, \$37.35, while oak was \$36.90 in 1919 and in 1929, \$29.26.

New York for 1939 reports 14,511 deer killed, 20% increase over 1938, due to opening six more southern tier counties.

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By H. GLEASON MATTOON

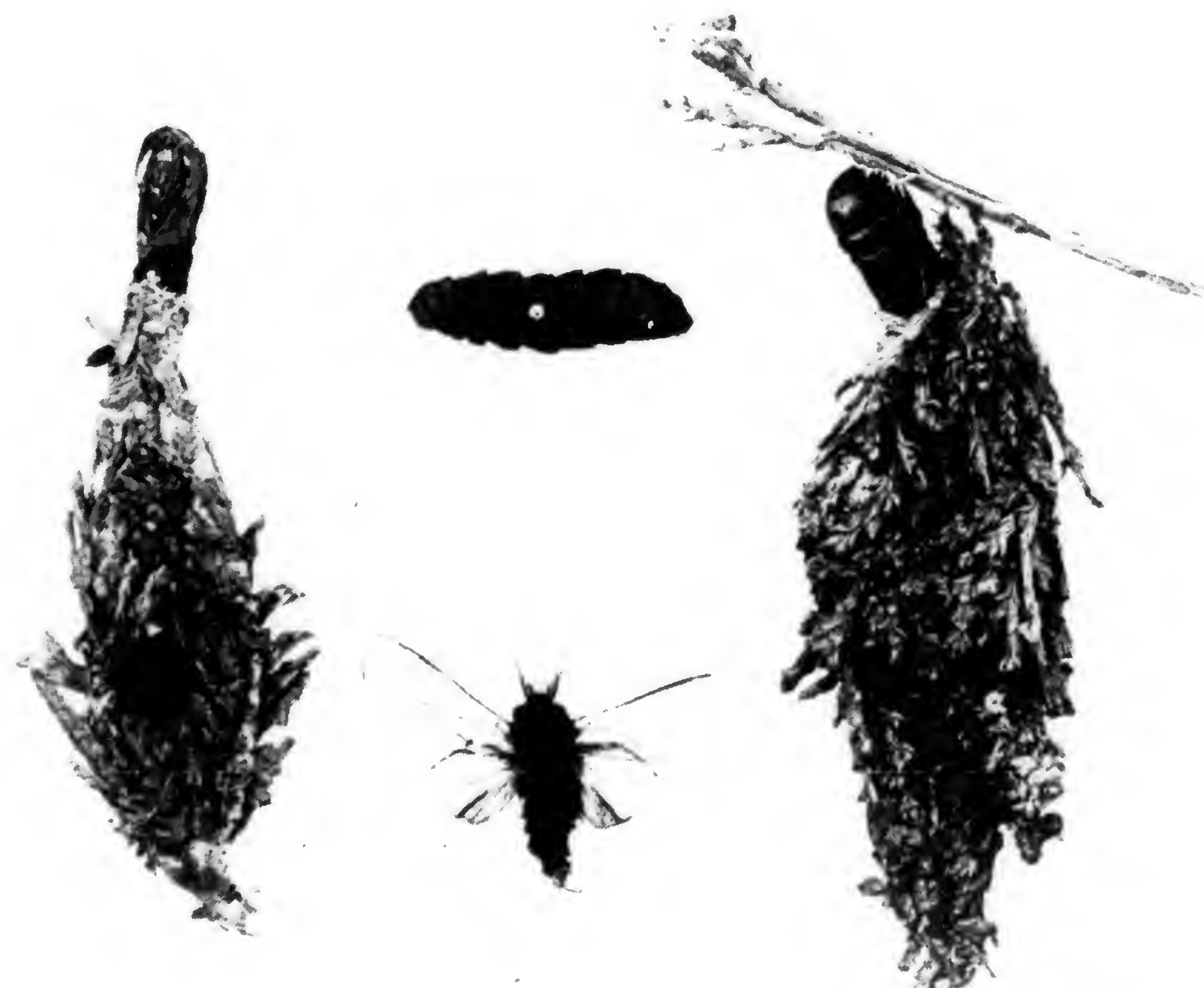
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Ten

FOREST LEAVES

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Eleven

THE DECLINE OF STATE FORESTRY IN PENNSYLVANIA

(Continued from Page 2)

ests by the Department of Forests and Waters. It is a situation that can not be ignored.

Farm Forestry

In Pennsylvania, 191,000 farmers own woodlots, having a total area of 3,665,000 acres. Twenty-three per cent of the total farm area is in woodland. This wood crop is important to the farmer. Land in trees should provide regular returns to him, as the rest of his farm does. It should be apparent that one of the best ways in which the Department of Forests and Waters could reach all parts of the State with its message of correct forestry practices would be by demonstration of the financial value of proper management of the woodland and close utilization of the wood products on one or more farms in each county. So many farmers are operating in the red or so close to the line that they are usually anxious to find means of cutting down cash outlay by greater utilization of the products of the farm. The intelligent management of the woodland will bring the farm that much nearer self-efficiency.

All of which seems apparent, yet I have talked with many farmers who believe that the Department of Forests and Waters does just three things—grows trees for reforestation, fights fires, and looks after the state forests. I feel confident that the Department of Agriculture would welcome the cooperation of the Department of Forests and Waters in working out a woodlot management and marketing program.

Community Forests

The Department is, also, authorized to advise counties, cities, townships, boroughs, and school districts, in the establishment of community forests and to give guidance in management and use. This duty of the Department has been almost entirely ignored, principally because the district foresters are unable with the many demands upon their time to give the attention necessary.

Community forests have recreational and financial value which should not be ignored. This has been demonstrated not only in New England but, also, in the lake states. More than that, community forests bring the message of forestry closer to the people. It is for that reason that the Department should expend greater effort to see that those communities which have forests, manage and use them wisely.

Dissemination of Information

The lack of published information on forestry matters in Pennsylvania is common gossip. So far as I know, no Department of Forests and Waters bulletin or pamphlet has been prepared since 1933. A few printings or reprints of previously prepared material did appear, but during the last five years no information of moment has been put out. This inactivity likewise is subject to criticism. The foresters of the Department can not hope to see all who desire information and help. The publication of authoritative and useful information on forestry is definitely an obligation of the Department.

State Forest Purchases

Between 1898 and 1933 the state purchased 1,647,870 acres of land for state forests, an average of slightly less than 50,000 acres per year. Since 1933 but 3,065 acres have been bought and much of this is not state forest land. It is acreage necessary for dam sites in the flood control program. Whether we agree that the State should own three million or five million of the thirteen million acres of forest land in the Commonwealth, a regular and consistent program of purchase should be instituted and pursued.

Of course, if the Department is not going to do any more with the state forests than it has in the past, it might be well not to hope for further purchase. I believe, however, that the narrow, short-sighted policy of the past few years will be changed, that the Secretary will some day have a vision of the service the Department might render to the people of the State and of the obligation implied in his position to see that the Department does everything possible to render that service. Public forestry is more than the growing, care and utilization of trees, it is part of the political science of state government and affects the economy of every citizen in the State. Not until the Department is imbued with this broader aspect of its obligations and influence can it render the service it should.

What are the causes of the decline of state forestry in Pennsylvania? The Pennsylvania Forestry Association invites letters from its members giving the reasons for the present lack of initiative and leadership by the Department of Forests and Waters. All letters will be considered confidential. Address them to The Pennsylvania Forestry Association, 1007 Commercial Trust Building, Philadelphia, Pennsylvania.

Recreation in the Rothrock State Forest

By F. H. DUTLINGER

THE Rothrock State Forest consists of about 40,000 acres of forest land situated in two separate units, about thirty miles apart. One unit, the Trough Creek Division, lies in the southwestern part of Huntingdon County, while the Licking Creek lands lie in portions of Mifflin and Juniata Counties.

This forest is named in honor of Dr. J. T. Rothrock, whom we recognize as the Father of Forestry in Pennsylvania. Dr. Rothrock was born and spent his boyhood days at McVeytown, Mifflin County, which is but five miles from the forest bearing his name. Many of Dr. Rothrock's early days were spent roaming the forested mountains of the Licking Creek and Blacklog Valley regions. It was undoubtedly in this forest environment, that his love for the open spaces was fashioned, and which influenced his life to the end.

Each of the forest units contains a recreational area, so entirely different in physical aspect that they are as unlike, as, "day is to night." One

is the bold, rocky, gorge type of terrain, the other the quiet, serene, beautifully wooded valley type of country.

The Great Trough Creek, so geologists tell us, during eons of time, wore its way through Terrace Mountain to its present location. Along this turbulent and crooked creek is to be found a recreational area entirely different from the others. The treatment of the subject here is unique.

A recently completed stone dam with a sandy beach, sheltered by lofty oaks and pines, provides bathing facilities. Deep drilled wells provide cold drinking water. An abundance of stoves, fire places and tables are present, upon which can be prepared and eaten, the picnic meal. The usual assortment of facilities necessary to the pleasure and comfort of recreationists are provided, but the unusual and unique are also found here. Such wonders of nature as the Balanced Rock, Ice Mine, Copperas Rock, must be seen to be appreciated. The foot

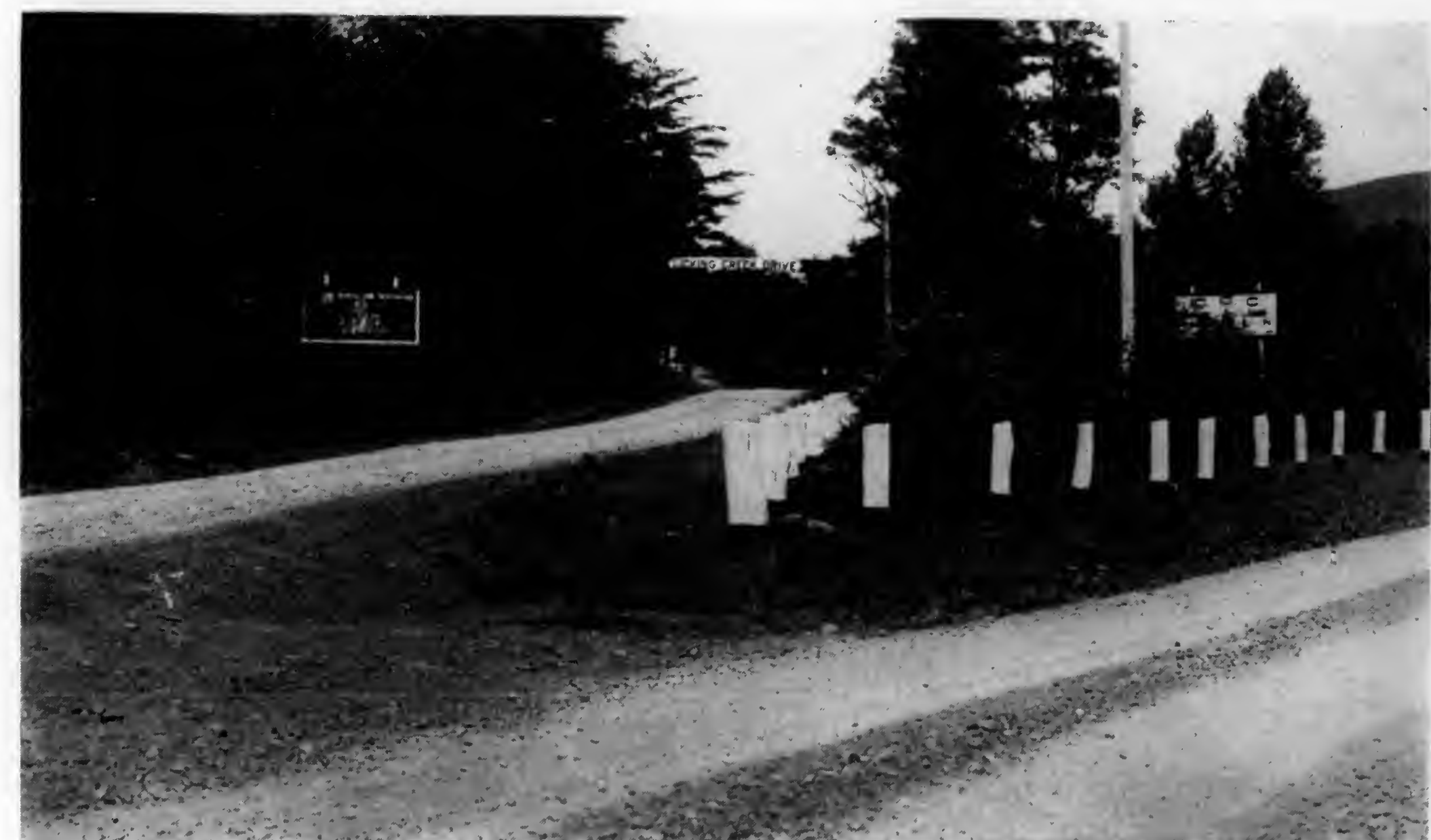


Photo F. H. Dutlinger.

Entrance to Licking Creek Drive—25 miles of continuous scenic beauty in Rothrock State Forest.



Photo F. H. Dutlinger.
Copperas Rock in Trough Creek Drive, Rothrock State Forest.

suspension bridge, Abbott Run Glen and falls, with five miles of trails through rhododendron, along cliffs, with breath taking vistas of forest and Trough Creek Gorge, are unsurpassed anywhere in the State. This State Forest is reached from Route 22 at Huntingdon, via Route No. 76 to Marklesburg and thence to Trough Creek Drive and recreational area.

The Licking Creek Recreational Area is reached from Mount Union via Highways No. 522 and No. 103 or from Mifflintown on Route No. 22 via Mifflin and the Licking Creek Valley. Part of the Licking Creek Drive, which extends through the entire valley, over 25 miles of State Forest land, is macadam road and the remainder of stone and shale composition. The County Line Public Camp is the nucleus of this recreational area. Here amid stately oaks, pines, and hemlocks, one finds peace and quiet, the requisite for the weary. Pure, cold drinking water, with tables, stoves and fire places abound.

East and West Licking Creek, some 30 miles in length provide good trout fishing. Deer, turkey, ruffed grouse and squirrel are plentiful in the valley and mountain sides. A nature trail winds throughout the park area offering lovers of nature an opportunity to observe or study the flora, fauna and geology of the area.

HOW SWITZERLAND CULTIVATES HER FORESTS

(Continued from Page 3)

voiced a general demand for better cultivation and preservation of the forest and in this respect the cantons of Zürich, Berne and Aargau were the leaders, with the others following after a short interval.

The latest statistics of forestation in Switzerland show that 30% of the entire area of Switzerland is covered with forests; 55.6% is devoted to agriculture and pastures and 22.6% is non-productive soil (rivers, lakes, roads, railways, building sites, rocks, glaciers, etc.)

Statistics further show that about 67% of these forests belong to individual villages or cities; 28.5% are private property and 4.5% only pertain to individual cantons. The ownership by canton, village or private persons shows a remarkable variation in the case of each canton and we thus find that the cantonal governments of Valais, Ticino, Grisons and Uri possess practically no forests. The biggest percentage of forests owned by villages, i.e. 94.3% is, however, found in the Valais and the highest percentage of private-owned forests, i.e. 78.8%, is to be found in the canton of Lucerne.

The most extensive forest conservation is found in the Jura region of Switzerland, i.e. in the cantons of Schaffhausen, Aargau, Basle (Land), Soleure, Berne, Neuchâtel and Vaud, where as much as 60% of the productive soil is devoted to forestation. While the high mountain regions appear thickly wooded at first, their production is poor.

Forests, as previously indicated, are considered a safeguard against natural forces, such as avalanches, land slides and inundations, and as a consequence there are certain laws prohibiting their unjudicious cutting down, and these laws apply to private-owned forests as well as to public-owned ones. All the forests in the canton of the Grisons, Appenzell, Ausser-Rhoden, Uri, Neuchâtel and Basle (City), are regarded as "protecting" forests, while in the cantons of Schwyz, Unterwalden, Glarus and Appenzell Inner Rhoden all public and a part of the private owned

forests are declared "protecting" forests. In the other cantons the public and private owned forests are partly "protecting forests" and partly non-protecting. Of the entire Swiss forest area 75.2% are considered "protecting forests" and 24.8% non-protecting.

These laws safeguard the Swiss forests from untimely destruction and no matter how much building may be done in a district, the forests have to be duly respected.

The different parts of Switzerland with their great variation of altitudes, are accordingly subject to different climatic conditions and as a result we find a similar difference in the forest growth.

In the Jura, for instance, the beech-tree plays a prominent rôle. It can really be considered the foundation of the Jura forest and thanks to its thick foliage it prevents the soil on the sunny slopes from drying up. The protecting presence of the beech-tree enables other more exacting species of trees to grow in their turn, such as the ash-tree, the maple-tree, the fir-tree and the pitch-tree. On all the slopes with a southern exposure the beech-tree is intermingled with the red pine.

In the plains we find a good variety of the following: the oak, the elm, the beech, the ash-tree, maple-tree, linden-tree, alder-tree, willow-tree, poplar-tree and the fir-tree and red pine tree. Today the pitch-tree also occupies an important place in these lower regions.

Approaching the Alps the pitch-tree and fir are more prominent and from 4,500 feet a/s the former alone remains. In the Central Alps the larch, the cembra-pine and the so-called mountain-pine are in particular evidence. In certain regions of the Bernese Oberland, in the canton of Unterwalden, around the lake of Lucerne and in the Rhine Valley the beech-tree is also well represented.

Finally, in the southern part of the Canton of Ticino, in Italian Switzerland, the chestnut tree grows in profusion.

While it was formerly the forester's principal task to dispose of the timber, to be a fairly good shot and to keep general order on his domain, the public has since the middle of the last century begun to wake up and with the realization of the immense value of the forests came a general demand for a more thorough and scientific instruction of the foresters.

A forestry school exists in Switzerland since 1855, being part of the Federal Polytechnic at Zürich. From 1855-72 the duration of the course was 2 years, from 1872-82 it was 2½ years, from 1882-1909 it was raised to 3 years and

since October 1909 it has been prolonged to 3½ years. This theoretical course has yet to be completed by an obligatory practical course of 1½ years. The duration of the entire course in the science of forestry amounts to 5 years.

In 1936 the public forests in Switzerland provided 30 million cubic feet of timber. Average annual exports amount to about 3 million francs, but there is still an annual importation of lumber for about 30 million francs. This somewhat surprisingly high import is explained by a continually increased demand for wood by the paper industry, also by a much developed building activity.

The statistics available concerning the average increase of the Swiss forest cultivation do not yet suffice by far for an approximate valuation of the respective financial returns. However, in all those cases, where it has been possible to investigate the question, the proposition has proved itself a paying one.

Thus it is shown, for instance, that the municipal forests of Aargau produce an average gross profit of \$14.00 per acre, those of Zürich, Winterthur and Morat \$12.00 per acre and the most recent statistics in the case of Winterthur indicate a revenue of \$14.90 per acre. Admitting that these are somewhat exceptional instances, we nevertheless find that the general results of the cantonal forests of Aargau and Zürich reach a gross profit of \$8.00 per acre, while the richest state forests in Germany scarcely ever surpass a revenue of \$5.60 per acre. The returns in the Jura and the Alps, where the soil is naturally inferior, amounts to \$3.25 to \$4.80 per acre.

This steady and ever increasing revenue yielded by the forests helps to reduce taxation in Switzerland.

The climatic and hygienic value of forests must also be taken into consideration. No place becomes oppressive from the Summer's heat, or unpleasant through the Winter's cold, if it is situated in a forest region. It is an established fact that all the renowned Swiss health resorts are in closest vicinity to woods and forests whose purifying presence and wholesome fragrance act like a tonic on the human system.

Forestation is a crop which requires much patience at first, as it takes so long to mature, but the results obtained in Switzerland will undoubtedly induce other countries in time to adopt a similar system, which makes the best possible use of land not suitable for agriculture and which at the same time has all the climatic and hygienic advantages pointed out above, not to mention even the natural charm and soothing effect of a stretch of dark-green, silent forest.

A QUARTER-CENTURY OF WATERSHED PLANTING

PLANTINGS of trees on the uplands surrounding Oradell Lake, largest of the storage reservoirs of the Hackensack Water Co., in northern New Jersey, began nearly a quarter of a century ago, transforming it into what has now become one of the most scenic areas in the New York-New Jersey metropolitan district. The plan originated with the late Robert W. de Forest, President of the Hackensack Water Company from 1885 to 1931. Mr. de Forest foresaw, while Oradell reservoir was being built, the community value which would arise from scientific reforestation of a region which had been disfigured by the construction operations accompanying the expansion of Bergen County's water supply.

"While added years of growth will enhance the beauty of the scene, this extensive body of water and its surroundings now represent the consummation of Mr. de Forest's vision of a natural lake of clean water, surrounded by quiet, sylvan beauty and forest, largely pine," states the report of Olmsted Bros. of Brookline, Mass., under whose direction the plantings were started and developed. The present scene, the report points out, is in startling contrast to "the appalling upheaval, destruction, disorder and offensiveness which was an inevitable accompaniment during the construction of the reservoir."

In an exhaustive discussion of the origin and development of the Oradell Grove, the report outlines recommendations for the maintenance of the area, including the introduction of new kinds of trees and shrubs. "The shore plantings of pines are in thriving condition. Although some years are still required to produce the mature result desired, the woodland effect has already been brought to the water's edge, and the distressingly raw banks have been practically obliterated."

"While in general the trees should and do come to the water's edge, there are several stretches where a grassy open area, backed by woodlands, replaces trees. These add scenic variety and should be retained. Thinning of the pine plantings has been carried out with excellent results in many places."

Most of the forest areas around Oradell reservoir, the report states should be of the closewood type; that is, the trees should be spaced closely, both because that type is esthetically the most suitable and because its upkeep is more practicable and straightforward than that of any other type. The Oradell forest areas embrace several hundred acres.

NON-POISONOUS INSECTICIDES

TWO garden insecticides, which when used according to directions are non-injurious to man and other warm blooded animals, have recently come into general use. These are mixtures containing rotenone or pyrethrum.

Rotenone is one of the active ingredients of the roots of certain tropical plants belonging to the Leguminosae. (Our locust tree is also a member.) These roots come from Africa and Central and South America, and are generally known as derris from Africa, and cube (pronounced Kuba) from Central and South America. These roots after grinding are mixed with clay or talc and applied as a dust; or, a wetting agent may be added and the mixture applied as a spray.

Dust mixtures may contain from one-half to one per cent of rotenone, and the wettable mixture from 4 to 5 per cent rotenone. Both dust and spray mixtures are on the market under several trade names. In making your purchases, be certain that they contain a given percentage of the active ingredient. Dusts should contain about seventy-five hundredths of one per cent of rotenone to be of general use about the garden. Use spray mixtures according to the directions on the container in which they are purchased.

Usually the dust form is more convenient to use, though the spray applications are more effective in some instances, as in Japanese beetle control. Rotenone is not effective against all insects. Several of our most troublesome garden pests are well controlled by a few applications. A little experience will soon show which are controlled and which are not.

Pyrethrum is made from the flower heads of a plant closely related to our oxeye daisy. Dalmatia for a long time was the country supplying this insecticide. Lately, Japan has been supplying large quantities. Some attempt has been made to cultivate the plant in this country, but up to now these attempts have not been very successful. Oil extracts of pyrethrum are extensively used as household and livestock sprays. There are a few successful garden sprays with pyrethrum as their active principle.

PUT YOUR MOUNTAINS TO WORK WITH TREE CROPS

Reforest with select species of oaks with sweet acorns, nuts, persimmons, honey locust, etc., that bear crops for man, beast, and wildlife.

Annual profits will make the timber seem a by-product. Europe and the Orient have done it for centuries.

Consultation and surveys on request. Write me.

JOHN W. HERSHEY
America's Foremost Tree Crop Consultant
Downingtown, Pa.

FIRST LEAVES

Our Program

1.
The adequate protection of all Pennsylvania forests from Fire, Fungi, and Insects.
2.
The personnel of the Department of Forests and Waters to be chosen and retained on a basis of efficient service only, in order to guarantee permanency of policy and continuity of action.
3.
The management of the State forests so that they may supply the permanent needs of the people not only for continuous timber protection but also for recreation, hunting and fishing.
4.
Greater co-operation between the departments of the State Government for protection of the beauty of the public lands.
5.
Adequate biennial appropriations for the purchase, protection, and development of the State forests.
6.
The education of the public, corporations, sportsmen, and forest land owners with respect to the value of our forests and the necessity for their development and proper utilization.
7.
The planting of trees and other useful vegetation on waste and idle lands and the continued distribution of seedlings by the State.
8.
The education of our children in forestry in both public and private schools. A love and appreciation of the forests tend to a better type of citizenship.
9.
The establishment of town and county forests which will bring pure air, pure water, and recreation close to the centers of population.
10.
The preservation of the few remaining areas of virgin timber in Pennsylvania.

THE PENNSYLVANIA FORESTRY ASSOCIATION

Organized in 1886

1007 COMMERCIAL TRUST BUILDING

PHILADELPHIA, PA.

I desire to support the activities of The Pennsylvania Forestry Association for the preservation and development of forest lands, and enclose a check for \$..... to cover membership for the ensuing year. One dollar of this amount is to pay for yearly subscription to FOREST LEAVES.

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Sustaining member	10.00
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*If paid for five consecutive years the person automatically becomes a life member.

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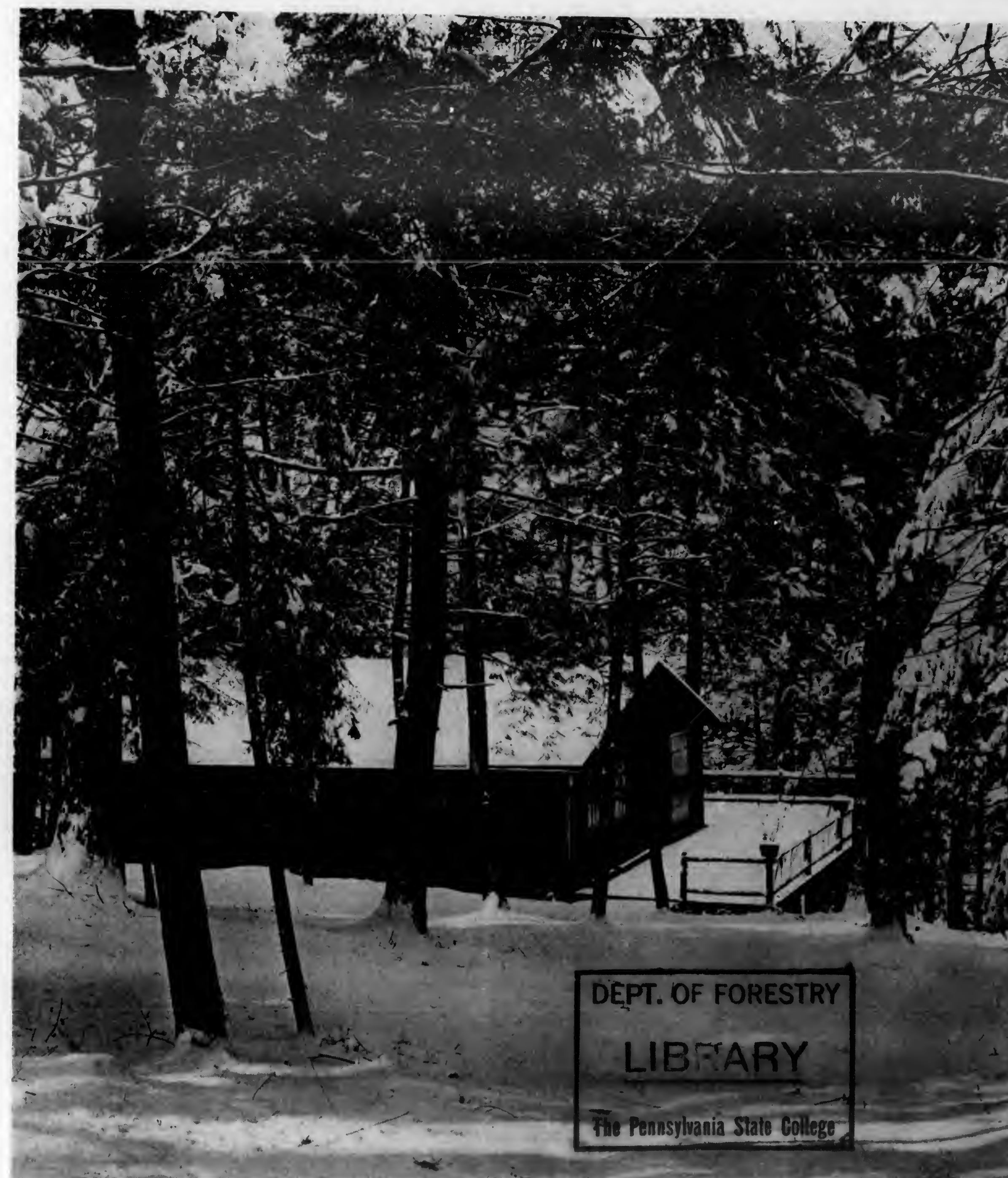
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FOREST LEAVES



THE PENNSYLVANIA FORESTRY ASSOCIATION

NOVEMBER - DECEMBER

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Whole Number 301

Insects Injurious to Pines

By H. GLEASON MATTOON

THE pines are our most valuable timber trees. They are, also, largely used for ornamental purposes. Frequently, certain insects are much more serious on individual specimens than on forest plantings yet the potential danger to the latter is always great. Of the insect enemies of this genus of trees, possibly the sawflies are most widely distributed in the State.

Sawflies

Sawflies are heavy-bodied, four-winged insects, which do not look unlike bees. The name sawfly

was given this group of insects because of the curious saw-like appendage on the abdomen of the female. With this, she cuts slits in the twigs of the tree in which to deposit eggs that in a few days hatch into larvæ, commonly called caterpillars.

These caterpillars feed on needles, usually devouring all of those on one branch before moving to another. When mature, they spin tough capsule-like, reddish-brown cocoons in which they pupate. The adult sawflies emerge by cutting off the top of the cocoons. Several species of sawflies construct their cocoons in the soil at the base of the tree or, occasionally, attach them to twigs.

At least seven species of sawflies attack pine trees in Pennsylvania. While their life histories vary, the caterpillars of each may be found feeding on pine foliage from June until October. Since conifers can not recover from defoliation as deciduous trees do, heavy attack frequently kills pines.

Control

In small plantations or on individual trees, hand picking of the caterpillars, since they feed in groups, is the most efficient and economical means of control. On larger trees it may be necessary to spray with a stomach poison. For this purpose, a mixture composed of one and one-half pounds of arsenate of lead, one pound of white flour or some similar sticker to fifty gallons of water will be found effective.

European Pine Shoot Moth

This imported pest seems to prefer red, Scotch, Mugho and loblolly pines. Although I have, also, seen rather heavy infestations of Austrian and short-leaf pine stands. While this insect is primarily an enemy of young trees, it occasionally attacks those above twelve feet in height.



U. S. Dept. Agr. Bur. E.P.Q.

European Pine shoot moth larva in bud of Scotch Pine

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U. S. Dept. Agr. Bur. E.P.Q.

European Pine shoot moth larva in bud of Scotch Pine



Spittle bug on Scotch Pine. Insert shows adult insect

The adult, a tiny reddish-brown moth, flies in late June and early July in Pennsylvania, laying its eggs on the tips of the twigs either on the needle sheath or on the twig itself. The grubs which hatch in about ten days bore into the base of the needles and later into the buds. In the spring the larvæ bore down the shoot, killing it. Severely infested trees make little growth and sometimes die.

Dead needles at the tip of the branch in August are evidence of infestation. Later as the borer works into the bud, exudations of pitch appear. By spring several inches of the branch may be twisted and dead.

Control

Because young stands are more often attacked, cutting out and burning the infested tips is usually the simplest means of control. Reasonably good results are, also, had by spraying with a mixture composed of two pounds of ground derris root, one pound of some sticker, such as flour or powdered skimmed milk, to fifty gallons of water. Two such applications should be made, the first about July 1st and the second, ten days

later. In both cases be sure that the terminals are well coated with the spray material.

Pine Spittle Bug

The pine spittle bug is a native insect which periodically is sufficiently plentiful to do serious damage to pine plantations. It, apparently, prefers Scotch pine although it may, also, be found on pitch, white, Banks, scrub and red pines. The damage, by both nymphs and adults, results from the great amount of sap they suck from the trees. The typical frothy mass in which the nymph lives is created by beating the partially digested sap into a froth. This spittle mass is added to by additional fresh sap from which a thin film of sap flows downward along the trunk or drops from the branches. Heavy infestation cause the death of trees, usually, by weakening them so much that they fall prey to other insects or diseases.

The nymphs usually hatch from the eggs in May and are full grown early in July. The adults continue to feed during the summer, but do not make the characteristic masses of spittle in which to live.

Control

Nature's most effective control is a parasitic fungus, which occasionally reduces the number

(Continued on Page 10)



U. S. Dept. Agr. Bur. E.P.Q.
Caterpillars of one of the Sawflies feeding on needles of White Pine



Certified

Holly

By G. LUTHER SCHNUR

Silviculturist, Allegheny Forest Experiment Station

WE have heard of "certified holly" for several years, but few of us have seen or used it. What is "certified holly?" Who certifies it, and why? Where can we get "certified holly?" These and many other questions arise when the subject is mentioned.

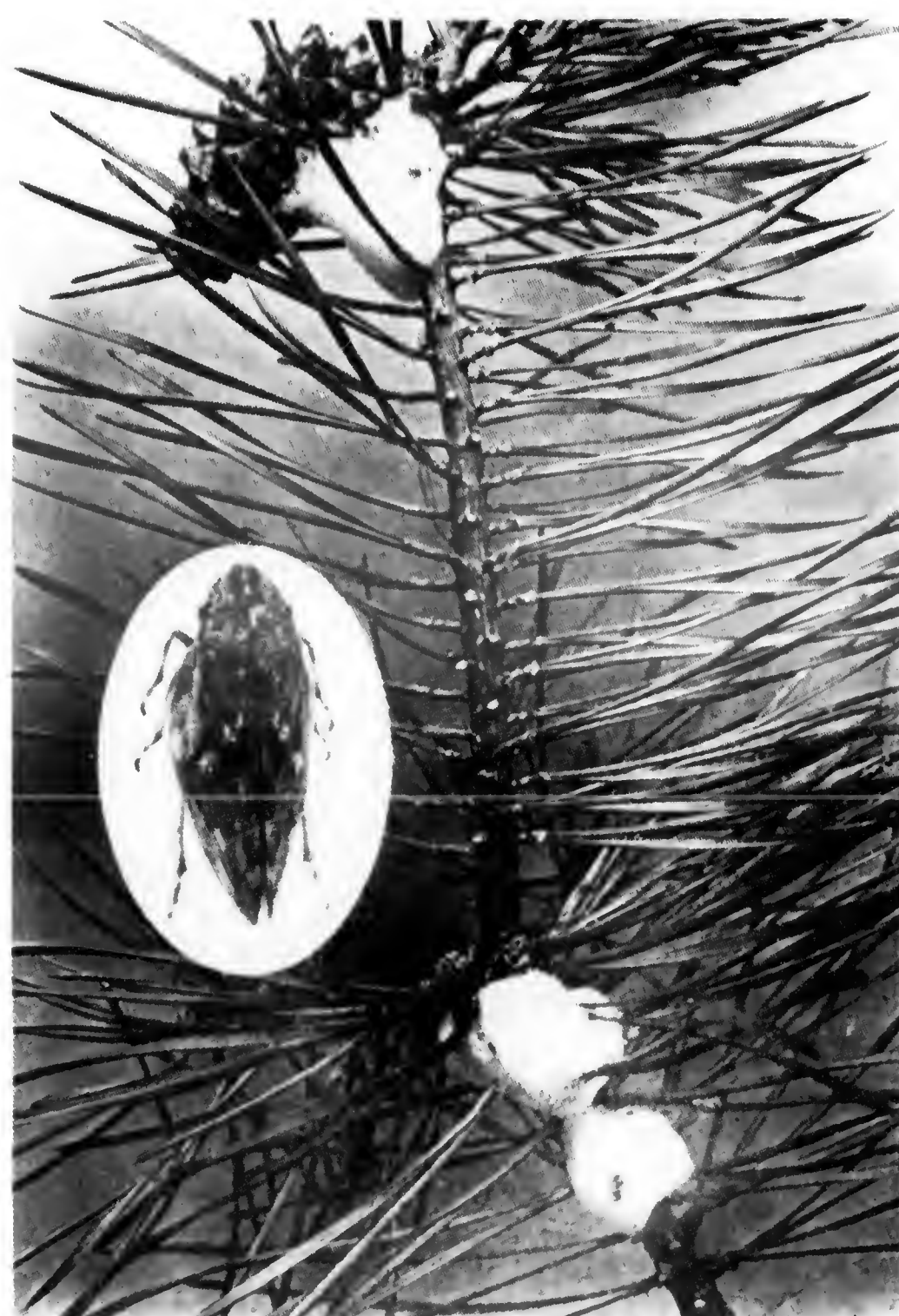
Certified holly is fresh cut, high-grade, berry bearing holly cut according to conservation principles. It is certified by the Maryland State Department of Forestry. Why it is certified is a rather long story, but may be summarized as follows: Several years ago the Garden Club of America became alarmed at the wanton destruction of holly trees by the "holly butchering" method of harvesting and began a movement to do away with the use of holly as a Christmas decoration. State Forester F. W. Besley, of Maryland, however, realized not only the futility of trying to do away with an old established custom, but also the possibility of sustained yield management of holly. Because the objective of the Garden Club, namely, the conservation of the native holly, could be attained by conservative management methods and still permit equitable uses of this forest product, "certified holly" came into being. At the solicitation of the Garden Clubs, therefore, the Maryland State Department of Forestry agreed to develop a conservative method of harvesting holly, and to act as a clearing house for "certified holly," furnishing an inspection service to insure that the holly thus

offered for sale was properly cut according to approved conservation principles, by the owner or his agent.

Butchering methods of harvesting holly entail the hacking off of all limbs on a tree from top to bottom. The salable holly is then sorted out on the ground and the rest left to rot. It takes about 15 years for a "butchered" tree to sprout out sufficiently for another such cutting, if it sprouts at all. No doubt such severe wounding does considerable permanent harm to the tree.

Recommended conservative methods of harvesting involve clipping of the branch ends only, in pieces not over two feet long. Using such methods, a tree can be clipped every two or three years with little or no damage to the tree.

For several years now "certified holly" has been sold by the growers on the Eastern Shore of Maryland through the State Forestry Department. The amount thus harvested on a conservation basis, however, has been pitifully small in comparison to the huge amount removed by "butchering." Conservationists interested in perpetuating our holly trees and assuring a plentiful supply for Christmas decorations for years to come should use "certified holly." If your local dealer cannot furnish "certified holly" it can be obtained from the growers on the Eastern Shore, through the Maryland State Department of Forestry, 1411 Fidelity Building, Baltimore, Maryland.



Spittle bug on Scotch Pine. Insert shows adult insect

The adult, a tiny reddish-brown moth, flies in late June and early July in Pennsylvania, laying its eggs on the tips of the twigs either on the needle sheath or on the twig itself. The grubs which hatch in about ten days bore into the base of the needles and later into the buds. In the spring the larvae bore down the shoot, killing it. Severely infested trees make little growth and sometimes die.

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Control

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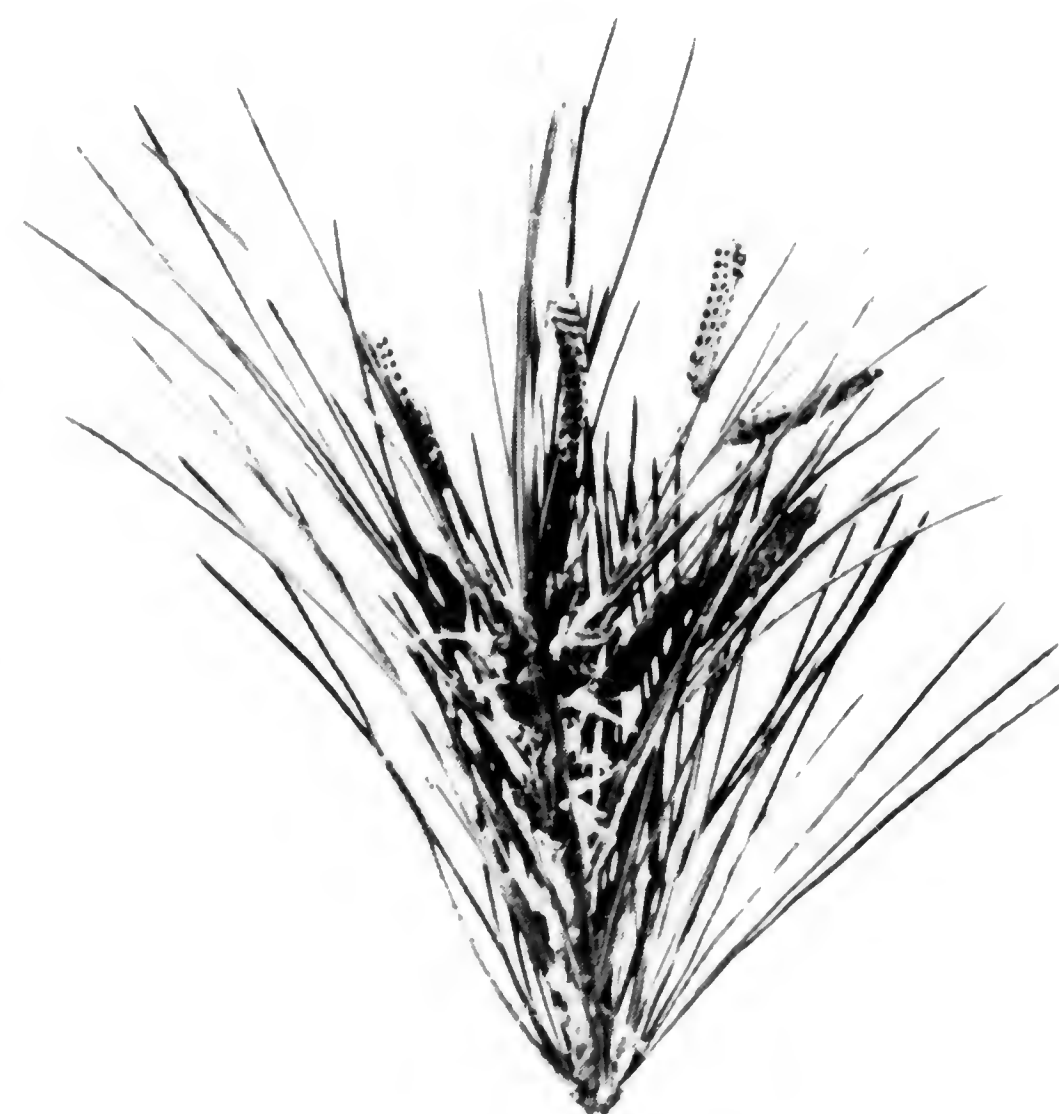
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F O R E S T L E A V E S

Two



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NOVEMBER - DECEMBER, 1940

Three

FOREST LEAVES

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Disseminates information and news on forestry
and related subjects.

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NOVEMBER-DECEMBER, 1940

ANNUAL REPORT OF THE DEPARTMENT OF FORESTS AND WATERS

Years ago the Annual and Biennial Reports of the Department of Forestry contained much of interest and value on Pennsylvania forestry. It is unfortunate that they are no longer issued, not only because the public is now ignorant of the multiplicity of activities engaged in by the Department, but also because the Bureau heads, in putting down in black and white the accomplishments of the year, might become conscious of the limited amount of work done compared with what might have been accomplished.

In 1916 the Department had 1,000,000 acres of State forests under its jurisdiction and employed 70 foresters. Today the acreage is 50% greater with over 80 recreational areas, while the foresters employed number but 43. Something is obviously wrong. Either the Department was greatly over-staffed in 1916 or it is woefully undermanned today.

In the 24 years since 1916, not only have 650,000 additional acres been added to the State forests, but the timber stand, because of protection, has reached such proportions that these areas now may well be called forests.

A forester of wide experience, who has traveled through most of the State forests of Pennsylvania has said that a minimum of 10,000,000 board feet should be cut on a selective basis annually for the good of the forests. He went

on to say that such selective cutting, rather than decreasing the stand, would actually increase the volume by reducing competition. Many acres are so over-stocked with sapling growth that there is little increase in diameter or height of most of the stems.

The Department is staffed by capable, willing foresters. No doubt many of them are aware of the benefits of some such procedure. Why is it not being done? Is it contrary to the policy of the Department? Is it due to a lack of sufficient foresters to supervise such a project? Is it because appropriations to the Department are so small that an adequate staff cannot be employed? Certainly the State would welcome the financial return from such selective cutting.

If the Department of Forests and Waters published an annual or biennial report the taxpayers, and that includes the members of The Pennsylvania Forestry Association, would know the answers to these questions. More particularly it would give the public official an opportunity to lay his case before the taxpayers and ask for help.

If the Department is understaffed, why is it? Certainly it is not because of any dearth of foresters willing and anxious to work. Perhaps it is that the administration is not conscious of the actual as well as the potential value of the resources controlled by the Department of Forests and Waters. The Pennsylvania Forestry Association requests that the Department furnish a report of its stewardship of this vast acreage of forest land and numerous recreational areas, of the miles of roads and trails, of the research being carried on, of its nurseries, of the fire protection results and of the help given to private land owners. In fairness to itself the Department should do this.

H. G. M.

A wax emulsion containing bentonite has been developed by Dr. E. J. Miller, of the Michigan State Experiment Station. When applied to trees and shrubs, this prevents excessive evaporation. It is of especial value before or at the time of transplanting, and it also reduces winter injury on evergreens. The concentrated material is diluted and sprayed on the trees or shrubs.

* * *

Reforestation of national forest areas, by tree planting and tree seed sowing, last year exceeded that of any previous year by more than 82,000 acres, according to a report by the U. S. Forest Service. Trees were planted on 214,306 acres and tree seeds were sown on 8,769 acres—a total reforestation of 223,075 acres.

Practical Aspects of Silvicultural Cutting

By E. O. EHRHART

Forest Engineer, Armstrong Forest Company, Johnsonburg, Pa.

FIRST of all, since a discussion of the subject above entitled could be limitless, let us define what we herein mean by "silvicultural cutting" and "practical aspects." Suppose we assume that silvicultural cutting is some method of predetermined and controlled cutting which investigation and experience has proved to result in an increment of the desired product greater than that from cutting methods which ignore any silvicultural control. In defining the word "practical" of the phrase "practical aspects," let us assume that cost is the limiting factor, and that the sum of the various cost items which make up the delivered cost of the forest product, inclusive of items for any departures from ordinary practices, shall not exceed current market value.

Along with these definitions, we have to realize that both practical aspects and silvicultural methods are never long fixed; they are in a state of evolution and constant flux. Further, they are interdependent. Accident or catastrophe can upset the best laid silvicultural plan; an invention for mechanization, or a simple change in procedure of operation may result in greater intensity of silviculture. Then, again, economic trends and immediate market conditions may help or hinder progress. The numerous factors affecting operating conditions, the regional and local variations of timber type and growing possibilities, all affect both practical aspects and silvicultural methods.

In northwestern Pennsylvania we have extensive areas of even-aged northern hardwood which resulted naturally from clear cutting of the old growth forest. The age range is generally up to 50 or 60 years. Study has shown that the greatest current increment in volume for wood occurs in the stage of from 20 to 40 years. This age class may naturally vary with the site. It shows that on good sites stands from 30 years upward contain enough merchantable material of a size suitable for pulpwood so that operation from a volume-cut standpoint may be practical, if the larger trees are taken. We find that these larger trees make up the bulk of the volume for wood

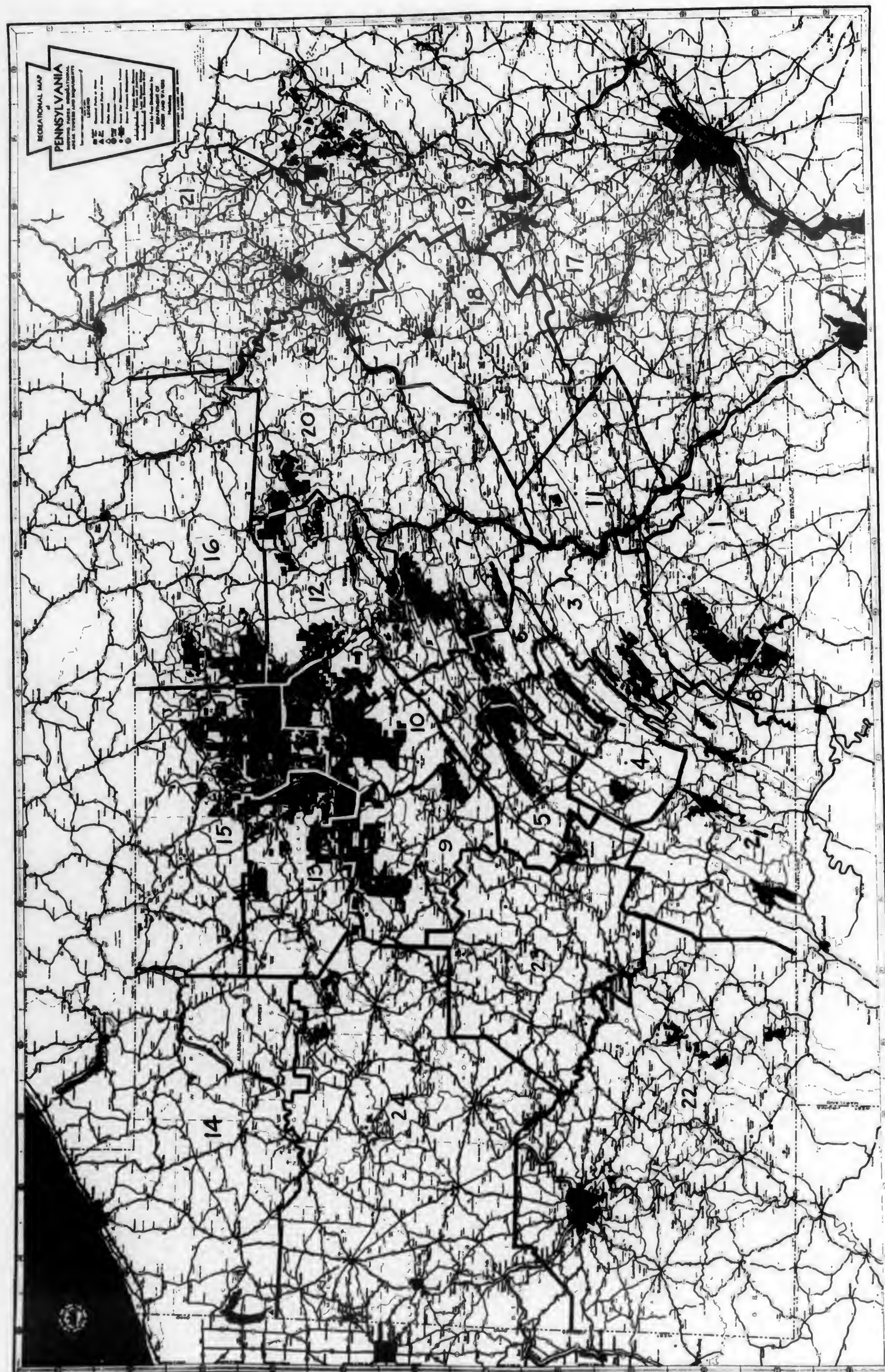
but that they are only a small proportion of the number of stems making up the stand. Another study, designed to give a cross-section of conditions, shows frequent variation in the merchantable volume, due not only to growing site, but also to natural mixture of species. A sample study plot from which trees 7 inches and up were removed from a 33-year stand, producing 15 standard cords of peeled pulpwood, has shown that the net increment over a ten-year period has exceeded that on the check plot from which nothing had been cut. On the check plot it was found that the natural loss of basal area amounted to 74% of the net increase for the period compared to 28% on the treated plot; in other words, there

(Continued on Page 13)



Selective cutting in a deciduous stand for pulpwood

Paper prepared for the Joint Summer Meeting of the American Pulpwood Association and the Woodlands Section of the Canadian Pulp and Paper Association.



FOREST DISTRICT MAP OF PENNSYLVANIA

The State has been divided into 24 districts by the Dept. of Forests and Waters. A District Forester has headquarters in each. In District 1 at Fayetteville; No. 2, McConnellsburg; No. 3, Blair; No. 4, Mount Union; No. 5, Petersburg; No. 6, Millroy; No. 7, Mifflinburg; No. 8, Mont Alto; No. 9, Clearfield; No. 10, Renovo; No. 11, Harrisburg; No. 12, Williamsport; No. 13, Emporium; No. 14, Warren; No. 15, Coudersport; No. 16, Wellsboro; No. 17, Norristown; No. 18, Pottsville; No. 19, Stroudsburg; No. 20, Bloomsburg; No. 21, Scranton; No. 22, Ligonier; No. 23, Johnstown; No. 24, Clarion.

Why State Forestry is Declining in Pennsylvania

By H. GLEASON MATTOON

IN THE September-October issue of *FOREST LEAVES* a dispassionate analysis of the activities of the Department of Forests and Waters was attempted under the title, "The Decline of State Forestry in Pennsylvania." In response to a request for letters giving the reasons for the present lack of initiative and leadership by the Department of Forests and Waters, many members have written *The Pennsylvania Forestry Association* giving a variety of views.

Some apparently missed the point that the activities of the Department of Forests and Waters only were being discussed. By limiting the scope of the article to the work of this agency it was not the intention to cast any reflection upon the activities or accomplishments of other conservation or forestry agencies. Rather I felt it would be unwise to discuss forestry activities in general in one article. It may be that the work of the other agencies will be delved into later.

One person criticized the article because I did not give credit to other agencies for pamphlets published by them. The fact that the Extension Service and the Allegheny Forest Experiment Station have each issued several worthy publications during the last few years does not relieve the Department of Forests and Waters of a like duty specifically mentioned in the administrative code.

The false belief that the Department of Forests and Waters is an administrative agency only is held even by some foresters. This was clearly not the intention of the legislators who passed the laws creating the Department and defining its duties. The powers and duties of the Department are specific. Some of them are: "To divide the State into such convenient forest districts as it deems economical and effective, to administer, protect, develop, utilize, and regulate, the occupancy and use of the lands and resources of the State forests, to protect all forest land in the State from forest fires, fungi, insects, and other enemies, to promote and develop forestry and knowledge of forestry throughout the State, to advise and assist land owners in the planting of

forest and shade trees, to obtain and publish information respecting forest lands and forestry in the State, to assist in Arbor Day work and promote and advance any other activity in local forestry which the Department may deem helpful to the public interest, and to execute the rules and regulations of the Department for the protection of forests from fire and depredation."

This definitely places duties upon the Department beyond administration of State forests. It, also, disposes of the argument that farm forestry is the particular prerogative of the Extension Service.

Exception was taken by two writers to the section headed, "No Management of State Forests." The import was that most of the state lands were cut-over and burned-over mountain sides, hence they would not lend themselves to management plans. It is true that many were in that condition when purchased, but time and protection have created new forests on these areas.

The Annual Report of the Department of Forests and Waters for 1904 lists 549,000 acres in State forests; by 1907 the holdings had increased to 750,000 acres. In that year Forester William L. Byers presented in the Annual Report of the Department "A Working Plan for the Pennsylvania State Forest Reserves in Colerain, Southampton, and Cumberland Valley Townships in Bedford County." In other words, 33 years ago this acreage supported such a stand of timber that it seemed wise to work out some management plan.

In the Biennial Report of the Department of Forests and Waters for 1910 and 1911 appears a letter from Dr. Joseph T. Rothrock to Commissioner Robert S. Conklin. In it he tells of inspecting forest reserves in Mifflin County. Among other things, he said, "From all sides there came to me a revelation in the rapid growth of healthy timber. It will be but a few years before improvement cutting on a very large scale will be both profitable and necessary." That was 30 years ago. Other statements of excellent growth of timber appear in the annual reports for other years previous to 1916, with suggestions

for cutting programs. With the lapse of a quarter of a century since the last of these I firmly believe that some selective cutting programs should have been begun long ago. I believe, also, that anyone who travels through State forest lands in Potter, Cameron, Clinton and Tioga Counties, as I did recently, would agree that some type of selective cutting should have been started on many areas.

Causes of Inactivity

While several causes of the present condition of the Department of Forests and Waters were implied in the many letters received, to a large extent one cause was uppermost in the minds of nearly all. That is expressed by one as follows: "Tenure in office based on political sponsorship rather than technical efficiency has, of course, played havoc with Bureau morale." Others point out a little more emphatically that it will never be possible for the Department of Forests and Waters to function efficiently so long as the foresters of the Department spend from one to two years every four worrying over whether they are to be reappointed or not. "How can a forester be expected to give serious thought to a management plan that may cover twenty years, if he is going to be fired in two years because he happens to be on the wrong side of the political fence," another asks?

Perhaps, the following letter expresses the thoughts of many most lucidly. It was written and signed by a member of the Association. The authorship, however, will be held confidential.

"If the Pennsylvania Department of Forests and Waters is sick, as Mr. Mattoon's recent article in *FOREST LEAVES* maintains, the major cause of its illness would seem evident to those with any continuous and intimate knowledge of the Department and its personnel. The chills which weaken or inhibit its activities and the fevers which excite it over the wrong thing are in my judgment induced by the disease called Politics.

"There is no partisanship in this belief. In the past dozen years two factions of the Republican Party and one faction of the Democratic Party have held office in Pennsylvania. Has any of them made the slightest attempt to substitute a merit system for the spoils system in the Department of Forests and Waters? If so, the effort has had no visible results.

"The performance of the Department cannot exceed the performance of the professional foresters who must carry the main load of creative thinking, public education, and administration of the physical resources entrusted to its care. In the early days of Pennsylvania forestry main-

tenance by the State of a special school for the training of its foresters enormously relieved the pressure upon the Department to appoint unqualified men. Public opinion backed administrative officers in filling vacancies from the roster of Mont Alto graduates. As the years passed there were no longer vacancies for all graduates of the Mont Alto Forest Academy, and its discontinuance became inevitable. Furthermore, with the steady increase in number of Pennsylvanians who had received forestry training either at Mont Alto or at State College, competition arose within the profession for appointments to vacancies. Some vacancies were deliberately created under political pressure to accommodate applicants. The ethics of no profession can stand the strain of free-for-all competition for public offices, and in order to defend themselves in jobs which they had competently held, many professional foresters were obliged to resort to political methods. When administrations change, those who have taken up the sword inevitably perish by the sword. There is a turmoil of dismissals and appointments, or long periods of apprehensive waiting. Public servants who must spend half of their time currying favor with politicians in order to retain their jobs cannot possibly give their best service to the public. Good men become discouraged, and weak men become cynical. When politicalization extends to the selection of paid fire crews, the end of all efficiency is not far off.

"The second point in the program of the Pennsylvania Forestry Association reads as follows: 'The personnel of the Department of Forests and Waters to be chosen and retained on a basis of efficient service only, in order to

(Continued on Page 16)

BACK ISSUES OF FOREST LEAVES NEEDED

Several members of The Pennsylvania Forestry Association are anxious to complete their files of *FOREST LEAVES*. To do so the following issues are needed:

Volume	Number	Month and Year
I	Entire Volume	1886
II	Entire Volume	1889
XIX	6	December, 1923
XIX	10	August, 1924
XIX	11	October, 1924
XX	Entire Volume	1925

Should anyone reading this notice have such issues that he is willing to part with, will he kindly notify the Association at 1007 Commercial Trust Building, Philadelphia.

Climatological Study of Old Timbers

By JOHN ANSLEY

A NEW science which analyzes the growth rings of trees, makes it possible to study past weather conditions in any forested region. Groups of volunteer workers, through the cooperation of the American Philosophical Society, are gathering cross sections of stumps of old trees and of timbers from barns, buildings, etc., to be studied for any unusual pattern in ring growth.

It was in order to obtain a section of timbers reported to be in old Durham Mine above Riegelsville, in Bucks County, Pennsylvania, that a small group visited this Mine a short time ago. The first furnace of Durham Mine was built in 1727 and the Mine and Furnaces continued supplying iron up to about the middle of the 19th century. Stoves were made in the Durham Fur-

nace and a good deal of the shot and shell for the Revolutionary Army. During five days alone in 1782, the Furnace shipped to Philadelphia 12,257 solid shot ranging from one ounce to nine pounds.

In one section of this Mine, the roof was supported by timbers. This section was completely sealed in 1793 and was not opened again until 1849. W. W. H. Davis in his History of Bucks County says, "The old tunnel was opened in 1849 after having been closed for fifty-six years; some of the heavy white oak timbers from eight to twelve inches in diameter, were bent by weight above them, but were sound."

When the Mine was visited recently by Charles Mohr, Joseph Sparmaker and Robert Swett, one



Photo by the Author

Counting the growth rings of a section of mine timber

of these timbers was removed and a section cut from it. It was given to Dr. Edward E. Wildman of the Committee on Education and Participation in Science of the American Philosophical Society, whose article, "Tree Rings Tell Interesting Stories," appeared in *FOREST LEAVES*, Sept.-Oct. issue. Dr. Wildman found that this piece came from a tree that was over one hundred years old and in several places the rings show a period of drought lasting in one case for three years. When a comparison of this piece can be made with many other pieces of timber that grew at about the same time or earlier, it will be possible to ascertain the year when these oak logs for the Mine were cut. When this is definitely established, an accurate weather report will be obtained for one hundred years prior to the time of the cutting of the logs. As each timber is located by amateur groups, overlapping different years, similar patterns will be found indicating the same periods of drought and of plenty but in earlier or later years of the tree's growth. By this method, it is hoped a study of climatic conditions can be gradually gathered. To help ascertain the correctness of material gathered, all possible information from old diaries, letters and the like that mention weather conditions will be studied.

Delaware Valley residents who are also tree-lovers and nature enthusiasts, are invited to participate in this study and may obtain information from W. Stephen Thomas, American Philosophical Society, 104 South Fifth Street, Philadelphia, Penna.

Insects Injurious to Pine Trees

(Continued from Page 2)

of spittle bugs to such an extent that no damage is done for two or three years. Then the pendulum swings the other way with an increase in spittle bug infestation for four or five years until a peak is reached about once in nine years. No artificial control measures have been tried on large Scotch pine plantings. However, for individual trees, spraying with a pyrethrum extract which carries a soap spreader at the rate of one pint to fifty gallons of water, early in June is effective.

White Pine Weevil

The white pine weevil is a native insect which does serious damage to young natural or planted pine stands in the northern half of Pennsylvania. Unquestionably, this insect is the most serious

enemy of white pine in some localities. Although it seldom kills the tree, by destroying the leader it reduces growth and the value of the tree for timber.

The adult is a small greyish-brown snout beetle, which starts laying its eggs in spring on the terminal shoot of the tree. The feeding and egg-laying by the adult causes small drops of rosin to appear on the bark. These are the first indications of infestation. The grubs feed on the inner bark and cambium completely girdling and killing the terminal shoot in a short time, usually by the middle of June. Examination will show many small white larvæ beneath the bark or in the pith. Occasionally, as much as four feet of growth is killed in this manner in one year.

Control

Since pure stands of young white pine are more susceptible, it is well to mix plantings with other species of trees, preferably hardwoods. On large plantations the cost of control measures is so great they are seldom attempted. On smaller or



U. S. Dept. Agr. Bur. E.P.Q.

Dead leader of White Pine infested with white pine weevil

FOREST LEAVES

isolated young stands, removing and burning the weevilled terminals in June has been successful. Individual trees may be protected each year against attack by white pine weevil by spraying at the time the buds are swelling, with arsenate of lead, using one and one-half pounds to fifty gallons of water. To increase the effectiveness, one pint of linseed oil should be added as a spreader.

Once the stand of trees has reached twelve feet in height the danger of serious infestation by this pest is past.

Pales Weevil

The Pales weevil is native to the eastern half of the United States and does serious damage to white and red pines in areas adjacent to freshly cut pine stumps, slash or lumber. The beetles seem to be attracted in great numbers to these areas by the odor. Feeding is usually confined to the tender bark and buds. The former is chewed off in irregular patches from the tips all the way down to the root system. Trees below two feet in height are readily killed, while those up to six to eight feet are seriously injured.

The adult beetle is a stout reddish-brown to black snout beetle about one-quarter of an inch in length. It hibernates beneath stones and in the soil at the base of trees during the winter, emerging in May to start its feeding. Eggs are laid in July in freshly cut pine logs or in the stumps. These eggs hatch in about two weeks and the grubs feed on the inner bark and cambium, forming oval cells in the sap wood in which to make their pupal cases. Adult beetles emerge in September.

Control

No satisfactory means of artificial control has been worked out. Since the beetles are attracted by the odor of freshly cut pine, it is important to do no planting near lumbering operations. Where it is possible to burn slash over the cut stumps, infestation of Pales weevil is reduced.

Pine Leaf Scale

A white, waxy scale insect attacks most species of pine trees. Occasionally, it is plentiful enough on one or more branches to kill them. I have never seen it a serious enemy of forest plantings, but it does do damage to ornamental and specimen trees.

The eggs hatch in May and for the next week the tiny insects crawl over the twigs and needles, locating a place to settle down to suck the sap and grow a protective scale covering.

Control

A most satisfactory control is had by spraying when the young are crawling and before the pro-



U. S. Dept. Agr. Bur. E.P.Q.

Needles infested by pine needle scale

TECTIVE covering has been developed, using any contact insecticide at summer strength. The time of the spraying varies somewhat from year to year, but usually these insects are crawling just as the petals of apple blossoms are falling.

Pine Bark Aphid

Both in forest plantings and on specimen trees pine bark aphid occasionally increases sufficiently to coat the underside of the branches and parts of the trunk white with its fluffy excrement. The damage done is minor so that normally control measures are not needed. However, any contact insecticide applied at summer strength with plenty of pressure will kill these insects.

Eleven



Swimming pool at Caledonia State Park, 50 miles from Harrisburg

Caledonia State Forest Park

By T. G. NORRIS

THE Caledonia State Forest Park has had a long period of development, and is more the outgrowth of popular demand than planned construction. Like Topsy, "it just grew." In the early days Caledonia was merely a wide place in the road where teamsters stopped to spend the night before crossing the South Mountain range. Later an Inn was built for the accommodation of travelers.

In 1837 a charcoal iron furnace was built at this point by Thaddeus Stevens, and operated until the Civil War. General Early objected to this furnace, and burned it when he passed through in June, 1863. From that time on, Caledonia ceased to be a place of any commercial importance. Other developments were tried here on a commercial basis, such as grinding the flint stone for use in making pottery. A New York Company built a railroad through Caledonia to remove iron ore from the section of the Forest known as Wolf Hill. When this railroad was completed and operations were ready to start, the Company

found they had been duped. The mine from which sample ore was taken had been "salted" with a high grade iron ore from the well-known mines at Pond Bank, near Mont Alto. This was the end of the last mineral development to be tried at Caledonia. Later on the timber was removed from the vicinity, most of the white pine being sawed into shingles.

From that time on the Caledonia section was developed from a recreational standpoint. Near the turn of the century, when spas were considered the last word in treatment of all diseases of the body, the Graeffenburg Springs were developed in order to bolster the waning trade of the Chambersburg-Gettysburg Turnpike. The Railroad Companies at this time were sponsoring excursions in order to increase their revenue, and Caledonia Park was one of the sections that was developed, along with a number of other outdoor recreational spots. In order to increase attendance at Caledonia, balloon ascensions, merry-go-rounds, band concerts, and other forms of out-

door entertainment were provided. After the railroad was removed, a trolley line was built from Chambersburg to Caledonia, which for a time increased attendance at the Park. A dance floor was built, and a log dam erected to provide boating facilities. A livery stable was established, at which horses could be had for riding or driving. The popularity of the Park gradually decreased, however, and it was not until quite a number of years after the State Forestry Department purchased this land that it received much additional patronage.

About 1920 the Turnpike was paved from Chambersburg to Gettysburg. This concrete road was dedicated as a part of the Lincoln Highway, and the development and increasing popularity of the automobile brought ever greater numbers of people to Caledonia. A tourist camp was constructed, and picnic grounds and hotel and restaurant facilities increased. With each new improvement, patronage exceeded the available accommodations. With the enthusiasm for golf as a means of recreation, a golf course was added in connection with Graeffenburg Inn. A small swimming pool was also constructed, but due to poor methods of construction, the pool was abandoned after several years for sanitary reasons.

It was not until the advent of the C.C.C. Camps that a definite development and expansion plan was made for Caledonia. A workable contour map was made of this area, and from this point the development of Caledonia was planned on paper. The big difficulty arising from traffic hazards on the Lincoln Highway was eliminated by changing the road and development of two large parking areas. In this manner also, cars were kept off the playfield. Facilitating buildings were erected at various places throughout the Park.

The day use areas, including picnic shelters, water lines, etc., were constructed by the C.C.C. The large swimming pool and bathhouse were constructed by the W.P.A., while several bridges and an administration building were also built by this agency. The N.Y.A. put their hand to developing a much needed Conservation Museum, and plans for the construction of a nature trail in conjunction with the Museum are already under way.

The next development at Caledonia will be a modern Tourist Camp, in order to relieve the over-crowded conditions which exist in the present tenting area. This work is scheduled to begin during the summer of 1941, and will be constructed by the C.C.C. Organization.

Practical Aspects of Silvicultural Cutting

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can be a heavy loss of material in a growing forest if we do not frequently utilize part of the stand.

Thus, if we are to attempt to obtain the maximum pulpwood increment, we have to utilize the larger trees from stands as young as it is possible in which to operate, while there are still plenty of non-merchantable stems to be left for growing stock. We also have to attempt to make the initial cut near the end of the period of maximum current increment, and leave enough stems which will correspond generally with a stand just entering this period. Silviculturally, the method of management, for an extended period at least, seemed relatively simple: to follow the principle of cutting out the larger material as soon as it became merchantable, and to repeat the cutting cycles on the same basis as frequently as permissible.

What was the answer from a practical basis, however? We were reasonably sure of increased growth, but what would it cost to follow such method? Not having been through the experience, we did not know whether the added cost of a definitely controlled operation, designed to get just what was desired regardless of all practical aspects, would be justified by the expected results. So we decided to attempt partial cutting without permitting any cost above current ones for clear cutting of old growth timber, and to make no investment in equipment or control which would not pay its way for the current operation.

The first step was to select an area of our own lands on which general conditions of timber stand and operation seemed favorable and which was large enough so that there could be a continuity of operation from year to year. Then a contractor was found who was willing to co-operate along the lines we had in mind. It was realized from the start that preparation of peeled wood from trees of under, say, 8 inches was more time-consuming than from trees larger than that diameter, and that effort would have to be directed toward the individual wood cutter to get this fact across to him in order for him to change over from his habitual practice of clear cutting to one of partial cutting.

The idea of marking trees for cutting was turned down for the following reasons: it would add to the cost of supervision; it would tend to

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arouse antagonism on the part of the wood cutter through regulation; it would necessitate checking the trees actually cut against those marked, with the possibility of either penalty for infractions or ignoring the fact that rules had been disregarded; it would, in a measure at least, interfere with the practical end of felling trees if the cutter had no latitude as to choice.

Instead of marking, we decided to make the partial cutting a matter of "cutter's choice," attempting to enlist his cooperation toward the desired silvicultural result, allowing the cutter to use his own judgment of what was practical. To start with, this meant a general request to the contractor and the individual cutters to attempt to leave, and protect from felling injury, those trees under 8 inches in diameter. Along with duties of general inspection of operation, scaling, and the follow up of accidents, our field staff made it a point to contact the cutters as frequently as was convenient, explaining what was desired and pointing out to them that since they were paid by the cord, they would get better production by letting the smaller trees stand. There was good response in a remarkably short time, and as progress was made, it was further explained that the diameter limit was to be considered flexible and could be adjusted to fit the size distribution as it varied locally. The cutters soon proved to their own satisfaction that they did not lose production by such partial cutting. An unexpected aiding factor was brought to light when, after a season's work, a cutter remarked that he liked this method as he then always worked in the shade. Another unanticipated and favorable factor later became evident as it was noted that with partial cutting, much less time was required by the cutter or other worker in moving brush out of the way.

The successful results of a season's cut on this one job proved that partial cutting was practical without additional cost, so that as occasion came, these same principles were followed on other operations in second growth stands, and even when extended to operations in mature timber that had been storm damaged, they were found to produce a much more desirable result silviculturally than where clear cutting is practiced.

The original partial cutting job has been continued, and used as an experimental and proving ground for other departures. For instance, in past practice, cutting-roads were marked out along which the cutter proceeded in his work and piled his wood, and these roads were usually spaced 50 to 60 feet apart. We found that they can be spaced 100 feet apart, and that this leaves not only more space undisturbed by wood re-

moval, but is a greater incentive to take only the larger trees which will reach across the cutting road, and a less number of smaller trees are cut to fill out a wood rank. We find, also, that the average cutter takes pride in doing a good silvicultural job when he is given latitude to work out the result himself.

We realized that if we are to have full cooperation from the wood cutter, and are to get full benefit of his experience with partial cutting, we must give him longer employment than merely through the peeling season. In order to bring this about we have experimented in permitting selected cutters to slash and peel throughout the peeling season, and to cut and pile up throughout the fall and winter. We do this by laying aside a certain area for one cutter, or crew as the case may be, and advance him (through the contractor, who is responsible), a minimum hourly rate until such time, when his wood is all piled and measured, that he can be paid a bonus determined by the difference between all his hourly advance and the amount of his production at a specified rate per cord. In several instances that we have tried, this procedure worked out satisfactorily. To cite an instance: one cutter working singly, produced 200 cords in this manner each of the last two seasons, whereas the average cutter's production when limited to the peeling season is about five cords. (This refers to hardwood, 52-inch-long wood). This year the same cutter was so intent on getting a block to cut by himself, he was perfectly willing to work on a block which we had laid out as a silvicultural long-time experiment, on which selected crop trees were marked to be left, the cutter to use "cutter's choice" in removing the balance. (Incidentally, the purpose of the "crop tree" study is to determine the practicability of instituting such type of cutting on selected areas, for the purpose of having a high value product that may be used for other purposes than pulpwood in the event that time will prove a surplus of material above pulpwood requirements.) The practice of giving a crew a block to work on also obviates the interference of operation caused by crews cutting adjacent strips, permits the cutter greater latitude in his choice of trees to cut, and gives him a greater sense of responsibility.

Along with the effort to educate the contractors and wood cutters silviculturally, we have set up several demonstration plots on which different degrees of cutting have been made. This year we have enlisted the cooperation of the Division of Private Forestry and the Allegheny Forest Experiment Station, both of the United States Forest

Service, in conducting a sizable experiment to determine the relative productiveness of the wood cutter in preparing wood from a uniform stand with different minimum diameter limits, namely, 5, 8 and 11 inches. It is hoped from this study to obtain factual evidence that can be of practical use in extending the practice of partial cutting, not only on our own lands, but to lands constituting outside source of supply.

While the establishment of partial cutting is naturally of prime importance silviculturally, there remain other problems, the solution of which may mean much more when measured by the final cost of delivered wood and the maintenance of continued supply. Improved silviculture may step up the wood increment per acre but, after all, stumpage represents only a small proportion of the cost of delivered wood, the percentage ranging roughly from five to twenty, and the prospects today are indicative of lower rather than higher cost of stumpage. Thus savings within operation conceivably can amount to much more than saving due to lowering costs of growing wood. But if such saving can result from permanent improvement made possible by new device or practice, and useful for future cutting cycles, there is added reason for improved silviculture since there would be increased volume to be taken out under lower operating costs.

To illustrate: one such problem is that of establishing accessibility. This we have attempted to meet by constructing woods roads ourselves instead of leaving that operation to the contractor. Ordinarily the contractor is not financially able to purchase equipment to build his own main hauling roads cheaply, neither is he in a position to determine their most advantageous location other than for his immediate operation. Our experience in building roads has been that the contractor is much better satisfied; that we have been able to effect a slight saving on the immediate delivered cost of wood: that the road system so far constructed will serve for additional wood supply both present and to be produced from future cutting cycles; and that the road system as planned will give added protection, besides serving as compartment boundaries. An important factor in the low cost of our road construction is a simple attachment placed on a road building tractor which we call a "tree dozer," which by giving added leverage permits us to uproot trees from the rights of way. Our costs for serviceable truck road over the last two years averaged about one hundred dollars per mile, including all items except general supervision and depreciation. (To those who may be interested, I would refer to a descriptive



Selective cutting in a Norway Spruce stand planted in 1909. Peeled pulpwood on the ground

article in the November 1939 issue of the "Journal of Forestry.")

Supplementary to the main hauling roads are secondary and feeder roads. Although our lands are mountainous, we have extensive areas of plateau lands at the higher elevations, on which it is possible to bring the truck directly to the stump. On such areas it would be exceedingly beneficial for both present and future cutting cycles if the complete road system to the stump could be semi-permanently established. Therefore, after some experimentation we have this year built such a complete system as an experiment on an area of 60 acres. Approximately 100 feet apart, parallel feeder roads are opened up through the woods with the tractor and the main humps or depressions leveled off. These feeder roads which serve to define where the trees are to be felled and the wood piled by the cutter may vary from one to ten chains long, and are located to gravitate to secondary roads or directly to main hauling roads. With the construction of the secondary roads, more time is taken to make them straight by pushing out trees, and more time is taken to pack and level the grade than in making the feeder roads. On this particular experiment, we are assured that the present operation will pay for the construction of this road network, and we feel that it will remain for use at the next cutting cycle, thereby substantially reducing the cost of later wood production. Thus, improved operation by lowering delivered cost, makes possible better silviculture.

Different conditions of stand and topography will necessitate other methods of handling. For the immediate future, however, we propose to concentrate effort toward developing accessibility

to the areas having best growing conditions combined with ease of operation. While this may sound like skimming off the cream, it really means that the expected benefits from partial cutting will first be obtained from areas that will give the greatest return.

No large timberland area is without diversity of growing and operating conditions, and we feel that selectivity of area for our approach to better silviculture is of utmost importance, letting the areas of more difficult silvicultural and operating problems await further development of our progress. Withal, we still believe that under certain conditions clear cutting of all merchantable material is today justifiable, even silviculturally.

If we are to make progress in the practical development of silvicultural cutting, we must have the utmost latitude in making different factors fit the pattern as a whole. Any tentative plans must be readily flexible, and if they are to be practical we must at times sacrifice anticipated silvicultural benefits. After all, as long as we have fire protection, time is the prime element in the return of the forest.

We need cooperation from governmental agencies rather than regulation. Our own experience is that certain branches of the United States Forest Service and other agencies have been giving real cooperation that has meant progress. On the other hand, we believe that regulation would create opposition and tend to hinder progress toward the common goal. Just to give an instance: with the advent of the wage and hour law, much of the time of our field staff is taken in checking the required record keeping, that might be put to much better advantage in training wood cutters to our methods or working out answers to mounting problems. Just as we have made some progress on the principle of cooperation from the woods worker, rather than attempting to regulate his every move, so we feel that governmental cooperation will give better returns than regulation.

Fundamental principles as a guide; study of conditions; flexibility of plan execution; cooperation with worker and government; willingness to attempt new departures; keeping within the boundaries of economics; and a faith that, given time, the job can be accomplished; these are the essentials, if we are to make progress in silvicultural cutting by practical means.

In 1939, twenty-four New York hunters lost licenses for one month to ten years for accidents.

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A big tree may have half a million leaves.

Why State Forestry is Declining in Pennsylvania

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guarantee permanency of policy and continuity of action.' The greatest service which the Association could render to the Department of Forests and Waters would consist in taking a vigorous and resolute part in the movement to set up in the State of Pennsylvania a thorough-going Civil Service system. This system would include the hiring of personnel on the sole basis of demonstrated ability, a proper system of promotion for efficient service, and the firing of those who are inefficient or unfaithful to their public trust.

"For many years Pennsylvania has had one or more organizations working toward a State-wide Civil Service system, and the most active oring with other organizations, as in the Merit System League, in which are represented some 30 or more organizations of public servants, laymen interested in public administration, and some others. The Pennsylvania Forestry Association has been a member of this League, has contributed in a small way to its finances, and through individual members has taken a more or less active part in its framing of Civil Service legislation, and advocacy of this legislation in proper quarters. Working alone, the Forestry Association can do very little to wipe out politics in the Department of Forests and Waters. Working with other organizations, as in the Merit System League, it can do a real job. With a paid secretary giving his full time to the Association, and with a rapidly expanding membership of influential people, the Association can, *if it will*, check the decline in State forestry in Pennsylvania, and put the State once more on the high road to real accomplishment in forestry."

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7.
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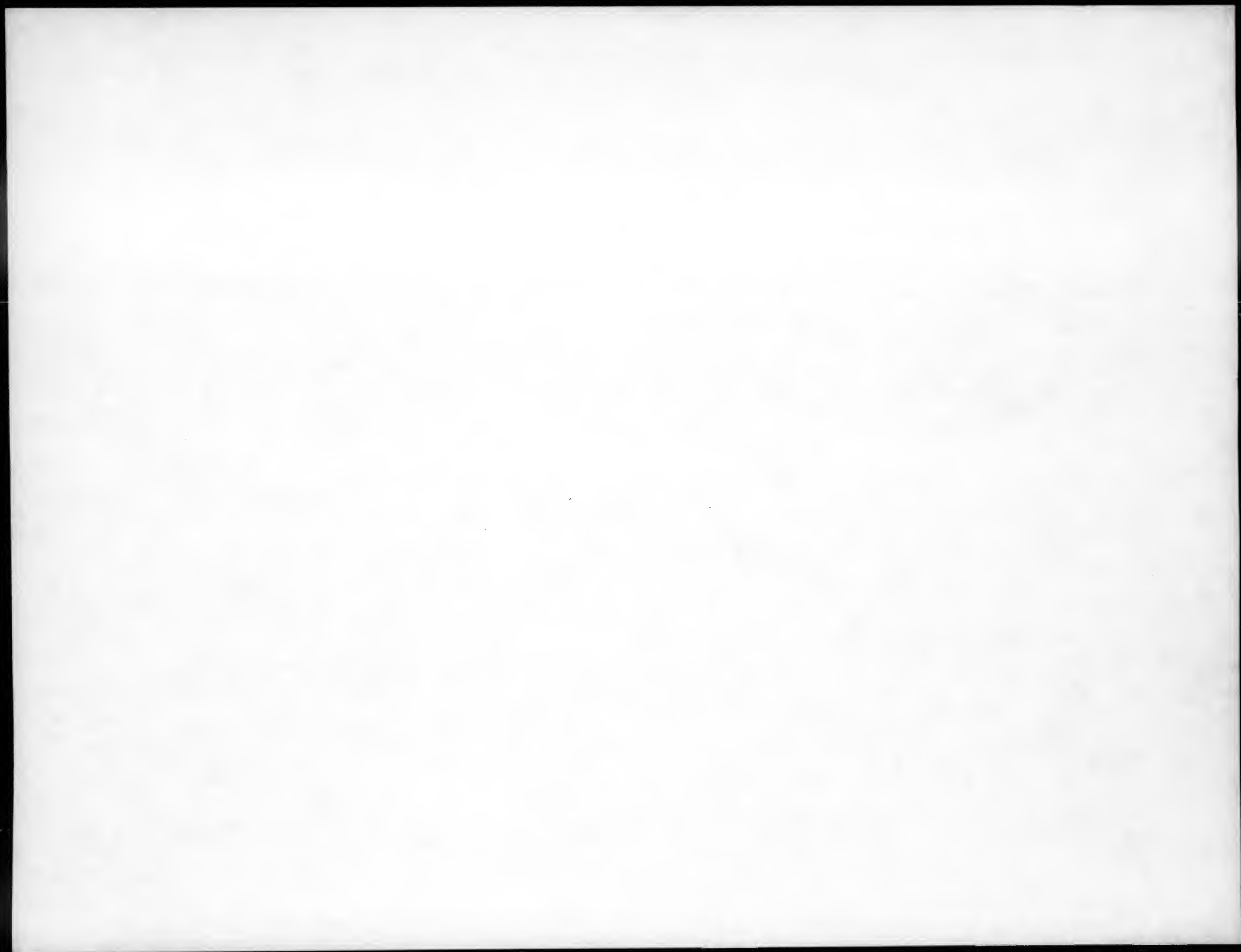
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